50 CENTS

Construction Methods AND EQUIPMENT

A McGRAW-HILL PUBLICATION

APRIL, 1957

Truck-mounted rotary earth borers dig 24-in. by 20-ft holes for caissons to support a big warehouse in Morton, Ill. Six rigs drilled 641 holes in only 14 days ..... p. 2

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RECORDS* PROVE

Twice the rope life

**Case histories show the proof. Yellow Strand Flattened Strand Wire Rope is making records of double the life, and even more, compared to round strand construction wire ropes. Ask your distributor, or write us for actual records on its performance.*

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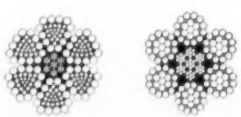

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Construction Methods AND EQUIPMENT

APRIL, 1957

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On the Cover

Rotary earth borers do a fast, efficient job of digging 860 holes for caissons that will support Caterpillar Tractor Co.'s new warehouse near Morton, Ill. See the story, page 115.

Prestressed Concrete

Reprints of the CM&E special report on techniques and equipment for prestressing concrete now are available. Single copies, 35¢; 10 copies or more, 25¢ each. Address orders to: The Editor, CM&E, 330 W. 42nd St., New York 36, N.Y.

MEMBER

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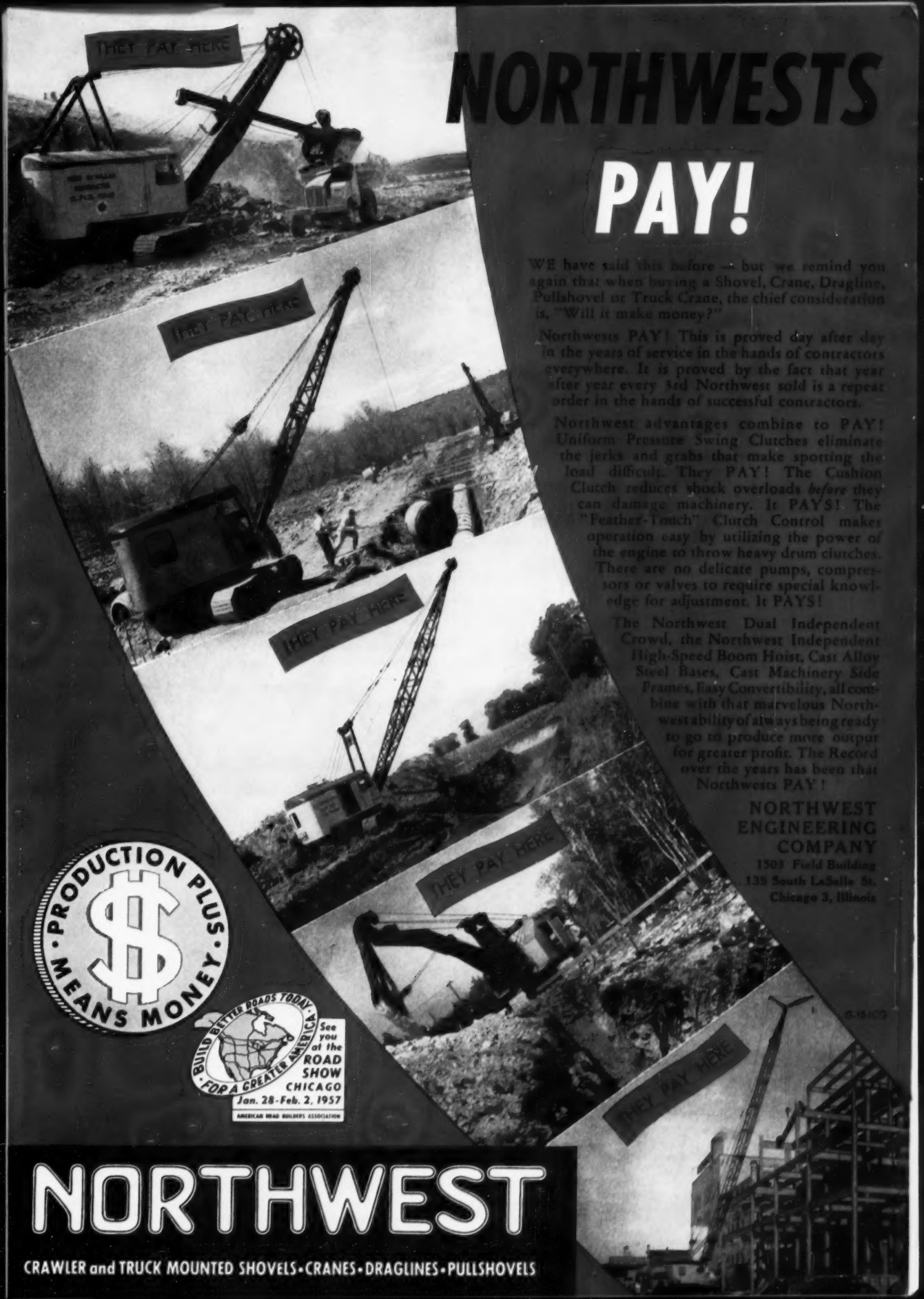
NEXT MONTH

Owners protect themselves with bonds from the time they receive bids until they accept a completed project. Does the contractor benefit from the premiums he pays to protect the owner? Next month James Lucy, a bonding expert, answers this question and presents useful information about bonds.



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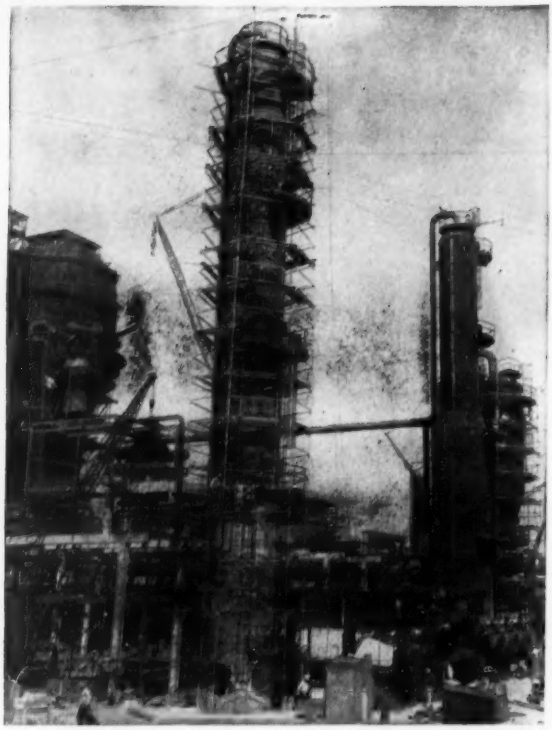
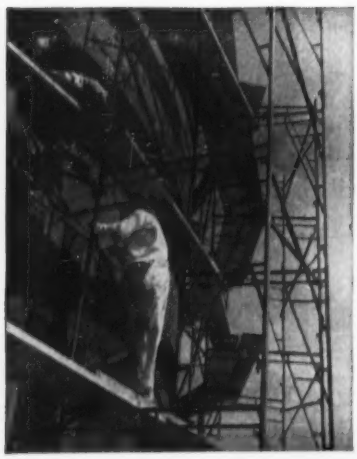
Scaffolding Methods . . .

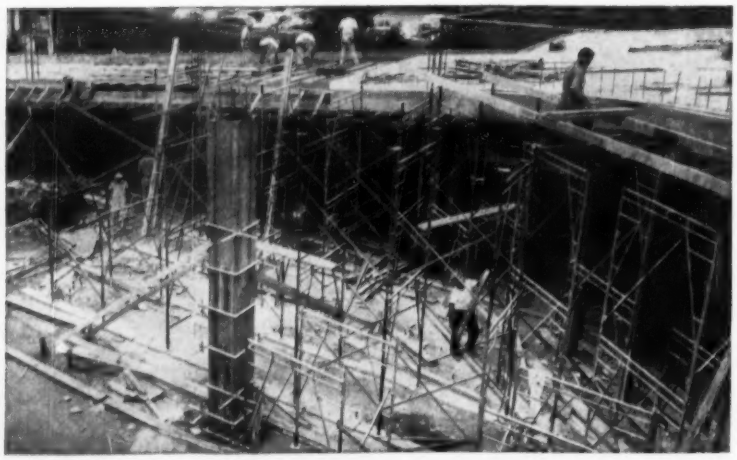
A Picture Report on Efficient Ways To Scaffold and Shore... by Patent Scaffolding Co.



BIG REFINERY JOB — Nearly 15 miles of "TubeLox"® Steel Scaffolding and 3,500 "Trouble Saver"® Sectional Steel Scaffolding frames are used by C. F. Braun & Co., contractor, to get safe, sturdy working platforms for building the new Tidewater Oil Co. Delaware Flying-A Refinery, Wilmington. Note how "TubeLox" Scaffolding provides easy access all over the 155'-high depropanizer column, center.



CLOSE-UP — "Trouble Saver" Sectional Steel Scaffolding surrounds an oil storage tank at the construction scene of Tidewater Oil Co. Delaware Flying-A Refinery, Wilmington. Workmen get close to apply exterior insulation.



SLOPING FORMWORK SUPPORT — Formwork for the concrete pan joist construction of the sloping vehicle ramp at the Arnold Constable Store, New Brunswick, N.J., is supported by 5'-wide "Trouble Saver" Sectional Steel Shoring frames. 160 2'-wide Ladder Scaffolds are also used to support 18"-deep beams varying from 30" to 54" wide. James Mitchell, Inc., is the general contractor.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation - wide engineering service available to you locally. See the Yellow Pages in your 'phone directory. For the latest information, specs, and installation data on all PS Co. Scaffolds, write for free 32-page CATALOG "A".

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143 h.p. . . .
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5-speed transmission . . .
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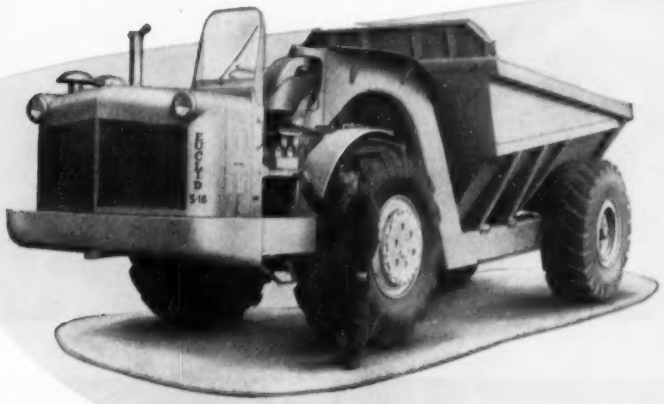

AND THE S-18 REAR-DUMP

35 tons payload . . .
32 cu. yds heaped . . .
300 h.p. . . . 27.00 x 33 tires
Torqmatic Drive . . .
NoSpin differential.

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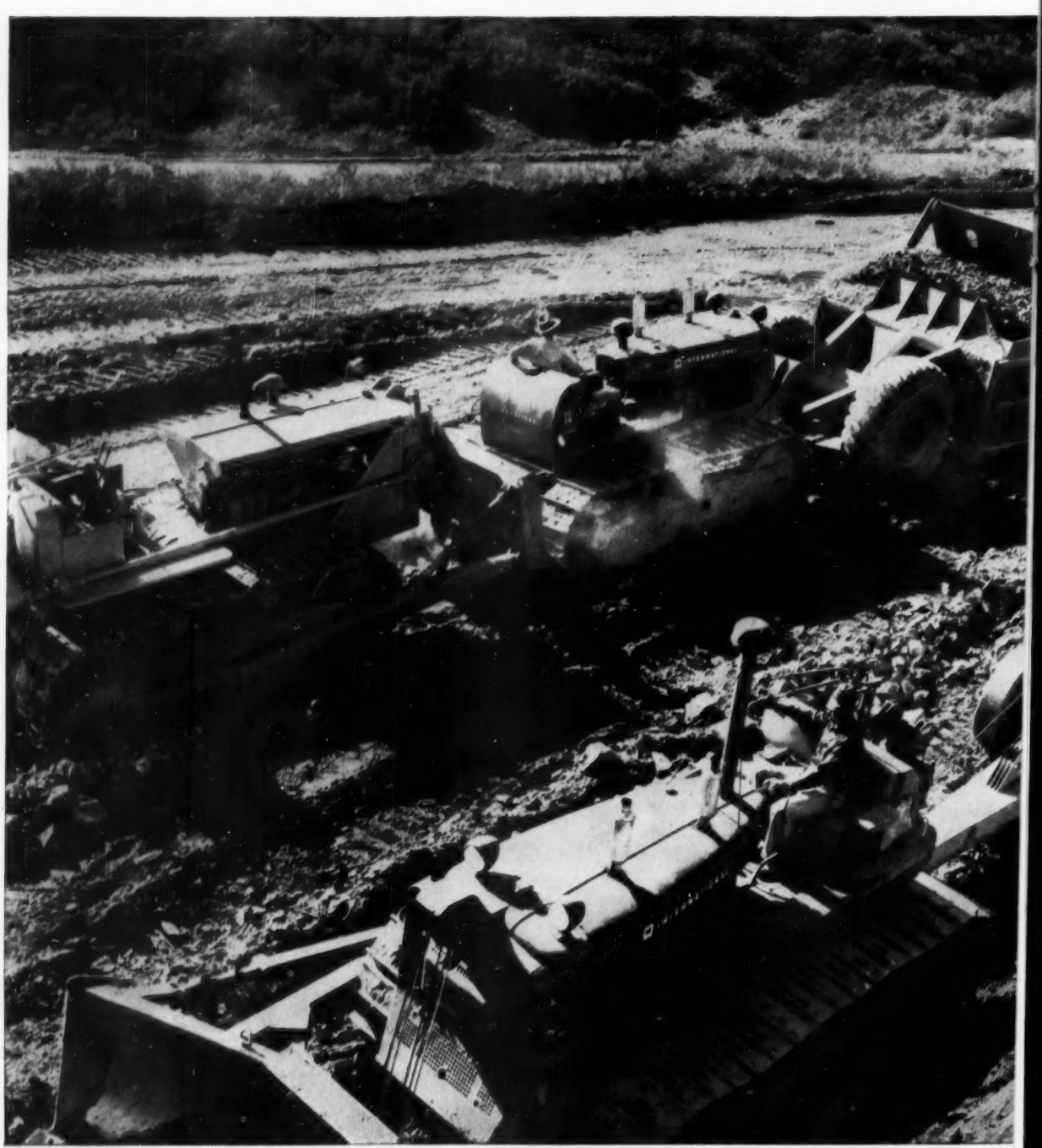

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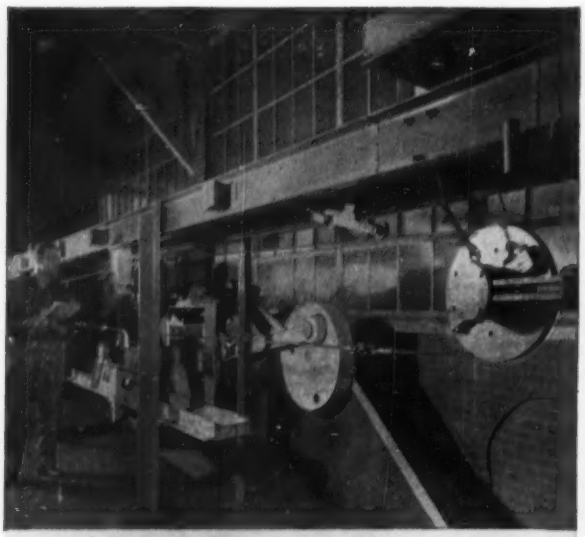
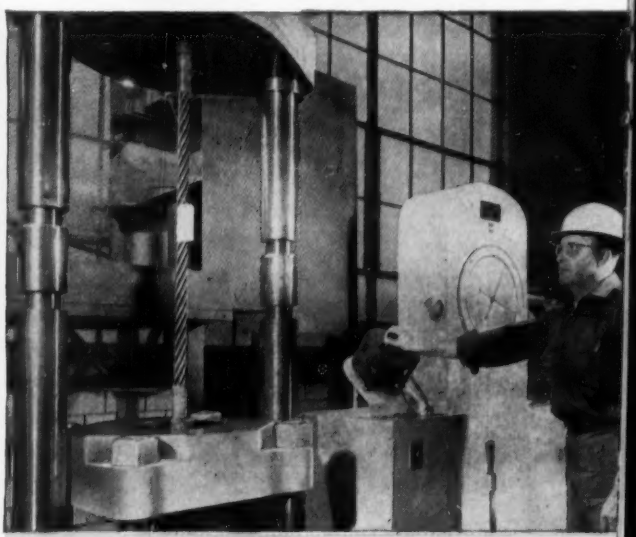
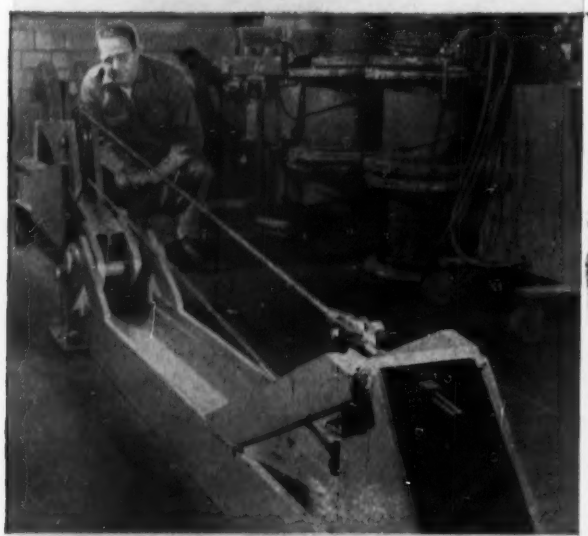
Why J&L wire rope service life



Fatigue machine. This 6 x 25 I.P.S. fiber core rope is being subjected to a continuous fatigue test to determine the number of reversed bends before breakage.



Cross-section tension test. This 1¼" 6 x 41 I.P.S.-RL fiber core rope was tested to 140,000 lbs. tensile load. Catalog requirement for same rope is only 123,000.



Vibration fatigue test subjects this boom pendant assembly to repeated shock loading. The 2,500 ft. lb. load provides action simulating actual field conditions.

Tension test of individual wires shows pounds of tensile load withstood before breaking. Every coil of wire used in J&L wire rope is thoroughly tested before acceptance.

salesmen can talk with confidence

To users and buyers of wire rope, safety and long rope life are all-important considerations. When you specify J&L, you can be confident you are buying wire rope that will stand up to the job for which it is made.

Every strand of J&L wire, every finished wire rope, is subjected to exacting tests to determine maximum factors of strength, flexibility, abrasion and corrosion resistance. This quality control is a most important operation in the production of J&L wire rope. Shown here are some of the tests that enable your J&L wire rope salesman to talk about quality with confidence.

The next time you buy wire rope, call your nearby J&L representative, or write direct to the Jones & Laughlin Steel Corporation, Wire Rope Division, Muncy, Pennsylvania.

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STEEL
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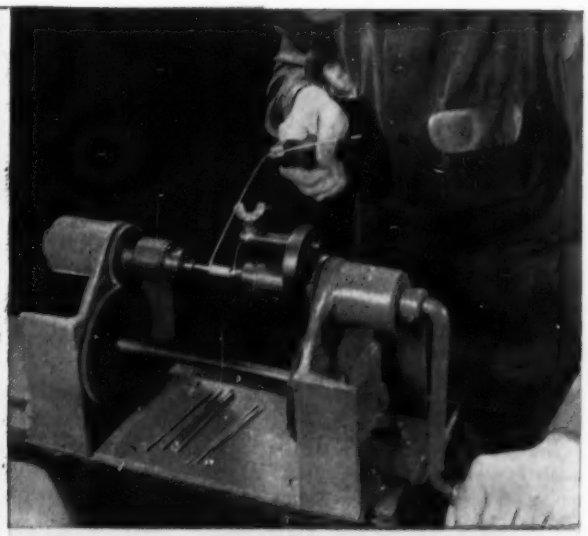
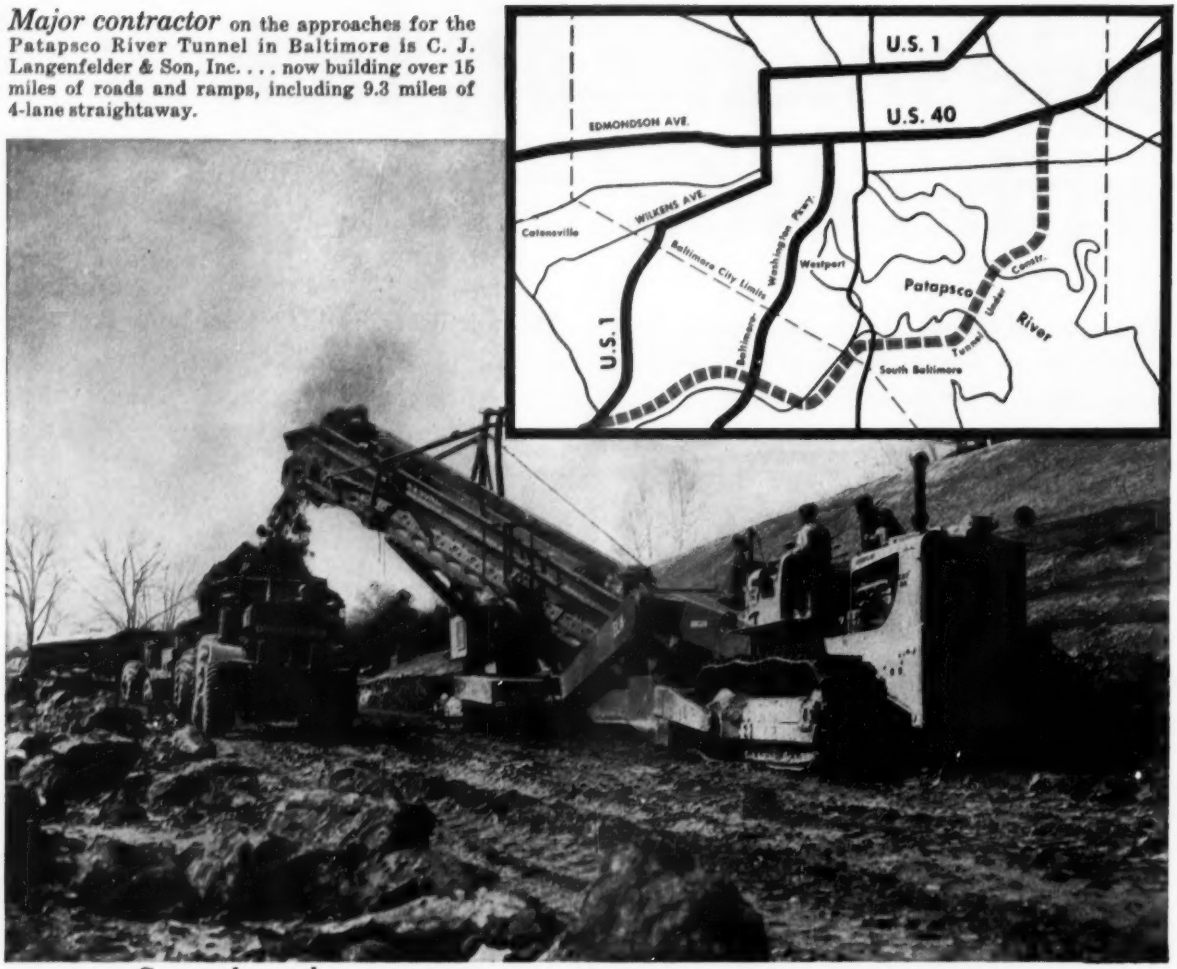
Torsion machine tests ductility by twisting wire. This 8" length of .081 wire took 41 revolutions before snapping. Federal standards require only 26 revolutions.



Wrap test. Galvanized wire is wound eight times around a mandrel of its own diameter and then unwrapped, proving ductility of wire and the bond of the coating.

(Protective screens removed during photography.)

Major contractor on the approaches for the Patapsco River Tunnel in Baltimore is C. J. Langenfelder & Son, Inc. . . . now building over 15 miles of roads and ramps, including 9.3 miles of 4-lane straightaway.



Super-charged diesel – a Langenfelder D-8 "Cat"– in action on the Patapsco Tunnel Project.

C. J. Langenfelder & Son, Inc., Baltimore,

reports fewer overhauls, lower operating costs with ESTOR D-3

The Patapsco Tunnel Project is a gigantic undertaking. More than 150 pieces of Langenfelder equipment have been working on the approaches – scheduled for completion in 1957.

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More and more contractors are finding out that in any equipment, on any job, under any operating conditions...it pays to specify *ESSO*.

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Construction News From Washington

Washington, D.C.
April, 1957

Federal Construction Cuts?

Budget cutting talk is reaching new heights, but it's too soon to tell how serious it will turn out to be.

In general, construction spending is relatively hard to cut. Much of the spending is tied directly to projects being built, projects which obviously can't be stopped—only slowed down.

First real chance for the budget cutters is the money bill for the Department of Health, Education, and Welfare. The budget requests about $145 million for construction during the year beginning July 1—not counting schools. This compares with spending of $78.1 million for the same programs this year. The House committee—which gets the first whack—should vote on this bill in a couple of weeks.

The integration problem may keep school grants from being voted. On the other hand, big highway spending is automatic now; tax funds are earmarked specifically for this program.

The big construction bills—public works and military construction—won't be voted out of the House committee until end of May. By that time you'll have some indication from action on smaller bills whether the Congressional talk about cutting Eisenhower's spending plans has any steam behind it. Most Washington people are skeptical that anything much will be done.

Atomic Expansion Hurt

Skyrocketing costs of building atomic power plants are adding heat to the battle in Congress over financing of a multi-million dollar construction program.

First hearings have emphasized the difference between the Republicans—who want the utility industry to build the plants—and the Democrats—who favor Senator Gore's $400-million federal program, or something like it.

Hearings brought out testimony like this: Consolidated Edison Co.'s plant will cost $70 million instead of $56 million; Duquesne Light Co.-AEC plant will cost $55 million instead of the earlier $37 million estimate. Other company officials report costs up from "25%" to "almost double."

In general this seems to put more edge on Democratic arguments that a federal program is needed to keep the U.S. up with or ahead of other countries in the atomic field.

AEC Chairman Strauss has promised to support government construction if industry doesn't commit itself to firm projects by the end of the year.

continued on next page

Costs Hit Highway Program

Washington officials are shocked over skyrocketing cost estimates for the new federal highway building program. The first detailed cost estimates are coming in from state officials to the Bureau of Public Roads. These new estimates will go to Congress next January.

Reports from half a dozen states estimate costs from 70% to almost 100% higher than the estimates given back in 1954 as the basis on which Congress voted the $25-billion federal aid legislation for the 40,000-mile interstate network. The new estimates will be used in making allocations to states for the three years beginning July 1, 1959.

The new cost figures aren't based on higher bids from contractors. But they do reflect the later and more precise design information state officials are getting.

Cost figures on which Congress acted in passing the new law were obviously very rough—but the best that state officials and the Bureau of Public Roads could provide at the time. Officials then weren't interested in inflating their estimates; it was enough to get Congress to go along with a package that then added up to $37.5-billion in federal tax funds.

Now that money outlays to the states are sure to come, state officials have a number of incentives to provide more accurate—and higher—estimates of the total cost of bringing their interstate mileage up to the specifications laid down in the legislation. For one thing, their allocations are partly based on this figure. And as the precise specifications become clearer, officials are finding that it's much more expensive than they estimated three years ago. Right-of-way costs, design, and steadily increasing construction costs—all these contribute in part to the zooming estimates.

Plant Expansion Continues

Business plans for spending on new plant and equipment are still going up, according to surveys by the Commerce Department and the Securities and Exchange Commission.

Expenditures for 1957 will be 6.5% higher than last year—when they hit a new all-time peak of $35.1 billion. The increase, however, shows a significant drop from the rate established in earlier years. Spending on new productive capacity in 1956 was 22% higher than 1955—one of the biggest percentage increases ever registered.

All major industries are expected to increase their spending rates during the first half of this year, except mining and commercial concerns. During the last half, the survey shows durable goods manufacturers also may ease off on spending for new plants and equipment.

Public utilities forecast a 24% increase in their spending for new plant—the largest gain of any industry. Other increases: railroads, 19%; manufacturing, 10%; non-rail transportation, 7%. Declines: commercial, 6%; mining, 2% from last year.

GOODYEAR INDUSTRIAL PRODUCTS
GT-Specified
FLEXSTEEL AIR HOSE for the roughest mine, quarry and construction service
A
B
C
A Soft, tan-colored cover to resist cutting, gouging and abrasion
B Superstrong, braided steel wire and cord reinforcement to handle high pressures, resist crushing and kinking
C Special synthetic seamless tube withstands both heat and oil

Best hose by a dam-site

HAMMERING through mountains of solid rock —drilling thousands of blast holes—forcing grout into countless fissures! They're all big and vital jobs on the gigantic St. Lawrence Seaway project.

So it's little wonder you'll find miles of FLEXSTEEL Hose there—feeding air, water and other materials to acres of high-pressure equipment. Contractors know this hose can take it: the dragging over jagged rocks, the stretching and straining, the rough, hurried handling.

You see, it's specified by the G.T.M.—Goodyear Technical Man—for murderous conditions that would soon wreck ordinary hose. It has a special heat- and oil-resistant tube. There's a cover that defies impact and abrasion. And it's muscled with super-strong braided steel wire. So it *lasts longer—costs less* to use.

Yet, with all that ruggedness, it's relatively light in weight—amazingly flexible. That makes it far easier to move from spot to spot—to maneuver in close quarters. And it means less strain on the men. Jobs are bound to move faster.

FLEXSTEEL Hose for *your* next job? Just contact the G.T.M. You can reach him through your Goodyear Distributor—or by writing:

Goodyear, Industrial Products Division,
Akron 16, Ohio

FLEXSTEEL HOSE by

GOODYEAR

THE GREATEST NAME IN RUBBER

Flexsteel—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

245 hours less greasing time...
245 hours more profit time EVERY YEAR!

Time saved by 1,000-hour lubrication intervals on your Allis-Chalmers tractor adds up to 245 hours every year—an extra month of production!

On truck wheels, support rollers and idlers, an exclusive combination of positive, spring-loaded seals and tapered roller bearings keeps out dirt and moisture, prevents loss of lubricant.

For 1,000 tractor work hours, you can forget about every grease point below track level. When it's time for servicing, simple low-pressure flush lubrication replaces old grease completely, eliminates seal popping, prevents damage to seal faces. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

IT'S SIMPLE ARITHMETIC!

	Other Tractors	Allis-Chalmers Tractors
No. of greasings per year (5,000 hr)	up to 500	5
Greasing time (av. conditions)	½ hr	1 hr
Time spent greasing	up to 250 hr	5 hr
PRODUCTION TIME GAINED . . . 245 HOURS EVERY YEAR!		

ALLIS-CHALMERS *Engineering in Action*

for Thelen Sand & Gravel
McHenry, Illinois

Gentlemen:

We have had our small portable Lippmann Washmore washing plant in operation for over a year here at our pit near Fox Lake, Illinois. It is doing an excellent job turning out 65 YPH right along and gives us the kind of high grade material we need to meet the demands of our customers. Besides this we have been getting excellent wear service with no "downtime" losses for repairs or replacements. In all we think it is a pretty profitable machine and would not hesitate in recommending it to anyone.

Signed: Vern Thelen
Owner

LIPPMANN
Portable Washing Plants

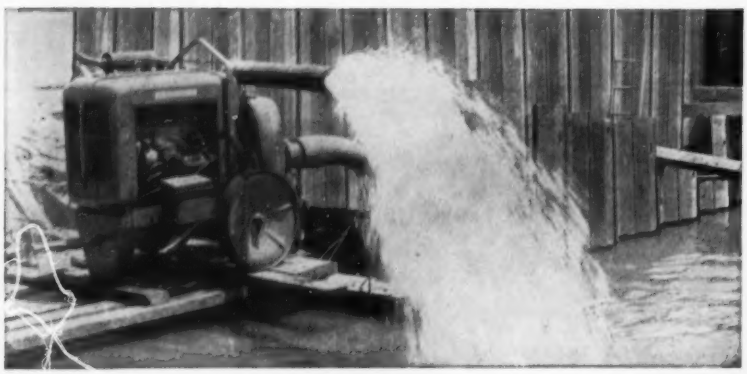
Sand and gravel producers, as well as contractors, are investing in portable washing plants for low-cost, near-the-job supplies. And those like Vern Thelen, who chose Lippmann are glad they did. In either the WASHMORE or SUPER-CAPACITY they get real mobility plus larger coordinated components that turn out cleaner products, accurately sized. They get greater sand recovery and low maintenance, and all for a price that is lower than that of washing plants giving ordinary performances. The WASHMORE with its large size scrubber, vibrating screen and sand drag will turn out up to 80 YPH in three sizes of gravel and one of sand, while the SUPER-CAPACITY produces 120-130 YPH, enough to keep up with a double drum paver. So whether you get the large SUPER-CAPACITY for heavy needs, or the smaller WASHMORE for light needs, you can expect greater production at lower cost to you. If you want to learn more about these amazing plants with the extra advantages, contact your Lippmann Distributor or write direct for Bulletin 1650. Lippmann Engineering Works, Inc., 4650 W. Mitchell St., Milwaukee 14, Wis.

1650-57-2

LEW **LIPPMANN**

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

Jaeger offers new pumps and higher performance for '57 work

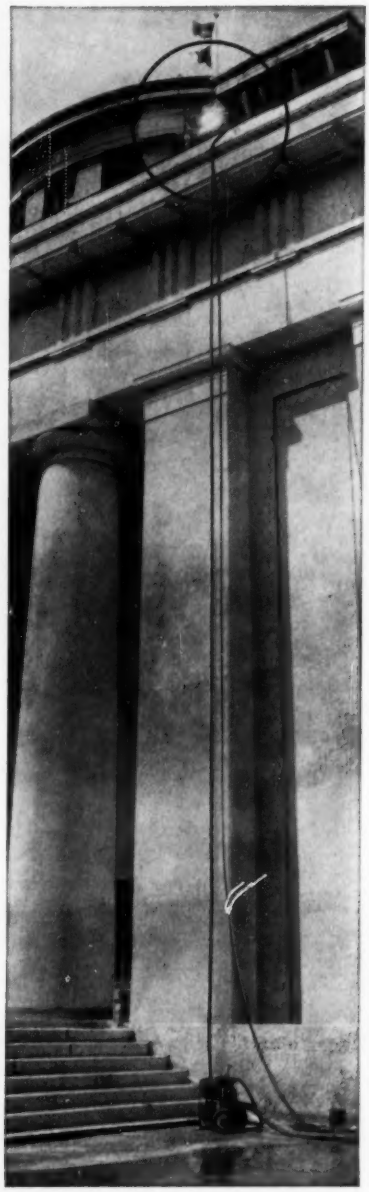


1720 GPM AT ONLY 1400 RPM WITH DIESEL-POWERED 6" PUMP . . . THAT'S *ACTUAL* PERFORMANCE

With high water, an unstable gravel river bottom and a good sized cofferdam, you do a lot of pumping. This 6" Jaeger "Sure Prime" is the only contractors' pump built that will move well over 100,000 gallons per hour with a 36 hp diesel engine at a fuel-saving diesel speed of only 1400 rpm. Higher capacities, at lower, engine-saving operating speeds, are characteristic of Jaeger "Sure Prime" centrifugals in all sizes, 1½" to 10". *Base your 1957 pump buying on 1957 information.* Ask your Jaeger distributor, or write today, for the *guaranteed actual performance* of 1957 model Jaeger pumps in the sizes your work requires.

NEW DIAPHRAGM PUMP HAS SPRING-BOTTOM BOWL

Revolutionary spring-bottom construction of Jaeger "DY" model diaphragm pumps prevents build-up of cement or clay deposits and also protects from shock if stones are sucked into pump. Light weight, free-swinging valves minimize resistance and give quick, tight closure for high vacuum pumping (4" model handles 4000 gph at 25' suction lift, up to 7000 gph at 10' lift). Surge chamber eliminates "kick", doubles hose life. Merely loosen 4 bolts and tilt frame back to change diaphragm. Built in 3" and 4" models that make other diaphragm pumps old fashioned.



VERTICAL HEAD IS 143'; PUMP IS A 2" JAEGER "SURE PRIME". The dual-purpose model 2PAFH gives you high pressure plus sizeable capacity. On this sand-blast cleaning job, Midair Construction Co., Akron, Ohio, used it to pump wash-down water to the dome of the Ohio Statehouse, 143' above pump location. On supply work it will deliver 65 gpm at 60 lbs. pressure; on drainage jobs it will move 140 gpm (8400 gph) at 10' suction lift.

See your Jaeger distributor or write for latest catalog and performance data on Jaeger Sure Prime Dewatering Pumps, Diaphragm Pumps, Pressure Pumps or Well Point Systems.

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • CONCRETE MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS

Now! A ten-ton wheel loader with ONE-LEVER control of all speeds – forward and reverse

- 21,000 lb
- 2-cu yd capacity
- 100 hp

New TRACTOMOTIVE TL-20 TRACTOLOADER®

FASTEST-OPERATING BIG LOADER YOU'VE EVER SEEN A full power-shift transmission with ONE-LEVER control enables you to go from *any* forward to *any* reverse speed *instantly*. There's no speed range lever — *one lever controls all speeds*, forward and reverse. There's no stop-and-go shifting . . . you quick-shift on the fly. And this ONE-LEVER control is exclusive with Tractomotive.

SMOOTHEST LOADING You get crowding action PLUS with a hydraulic torque converter drive that multiplies torque 350 percent. You quickly and smoothly load the toughest materials — no butting, no ramming, no engine stalls. And there's a scooping action, too, with the tip-back bucket. Result — heaping loads fast!

STRONGEST CONSTRUCTION The TL-20 is built to last with a one-piece welded frame and strong, pin-connected, planetary axles. Big lift and dump cylinders are out of the dirt and out of the way. Hydraulic system is protected with a full-flow micronic filter, as well as screen and magnetic filters. Unit construction makes servicing easy — saves hours on major repairs.

PLUS rear-wheel power steering . . . 4-wheel drive and 4-wheel power brakes . . . "Hi-Traction" differential . . . long wheel base for greater stability . . . rear-axle disconnect for free wheeling from job to job . . . 4-way adjustable seat for greater operator comfort . . . Allis-Chalmers diesel engine.

Ask your Allis-Chalmers dealer to show you the *extra* profit-making ability of the TL-20 — the very Latest In Big Loaders!

TRACTO — *a sure sign of modern design*

SOLD AND SERVICED BY YOUR ALLIS-CHALMERS CONSTRUCTION MACHINERY DEALER

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☐ Please send TL-20 Literature
☐ Have salesman call

Name .....
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Company .....
Address .....
City ..... State .....

Are you aware of the BIG THREE in CAT* bellows seals for idlers, track rollers and final drive? You get special, long-lasting FACING MATERIAL . . . just the right amount of CONTACT PRESSURE at the mating surfaces . . . and HEAVY DUTY DIAPHRAGMS to resist bursting and tearing. Each BIG THREE feature was *developed* and *proved best* for Cat-built Tractors. If it's a "look-alike" seal, who knows? Be sure to get parts you can trust—from your Caterpillar Dealer. He always has *exactly* the part you need.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Construction Machinery Price Trends

Price Index

	1955	FEBRUARY 1956	1957	PERCENT CHANGE 1956-'57
All Types of Equipment	133.8	143.5	156.3	+ 8.9
Cranes, Draglines, Shovels	**134.5**	**144.4**	**157.2**	**+ 8.9**
Shovel, ½ cu yd	129.6	141.5	149.0	+ 5.3
Shovel, ¾ cu yd	135.6	148.3	158.9	+ 7.1
Shovel, 1-1½ cu yd	139.3	152.3	165.8	+ 8.9
Shovel, 2 cu yd	126.4	131.3	139.2	+ 6.0
Shovel, 3-3½ cu yd	132.1	138.6	154.1	+11.2
Shovel, 6 cu yd	139.8	153.6	170.9	+11.3
Crane, truck mounted	134.7	150.1	161.0	+ 7.3
Bucket, clam shell	130.4	132.1	152.7	+15.6
Bucket, dragline	153.2	160.0	180.8	+13.0
Crane, tractor mounted	114.2	120.3	126.6	+ 5.2
Scrapers and Graders	**129.4**	**138.0**	**148.9**	**+ 7.9**
Scraper, 4 Wheel, 8-8.4 cu yd	126.7	132.9	145.2	+ 9.3
Scraper, 4 Wheel, 14.4-15.2 cu yd	124.4	129.1	140.6	+ 8.9
Scraper, 2 wheel	100.0a	107.0a	113.6a	+ 6.2
Grader, heavy duty	134.8	142.4	154.1	+ 8.2
Grader, light & medium	129.4	140.9	152.2	+ 8.0
Tractors	**142.1**	**153.5**	**168.7**	**+ 9.9**
Wheel type, off-highway	100.0a	109.3	118.6a	+ 8.5
Crawler type, 37.0-45.1 dhp	141.6	151.8	171.9	+13.2
60.5-75.0 dhp	143.2	155.3	174.8	+12.6
102.0-116.0 dhp	144.3	158.6	172.3	+ 8.6
126.0-155.0 dhp	151.2	161.7	178.0	+10.1
Machinery, Tractor Mounted	**134.2**	**141.8**	**154.3**	**+ 8.8**
Dozer, cable control	141.4	146.3	149.0	+ 1.8
Dozer, hydraulic control	140.2	151.3	169.8	+12.2
Cable, power control unit	123.1	130.3	136.6	+ 4.8
Loader, shovel type	125.7	131.1	146.5	+11.7
Specialized Machinery	**122.9**	**133.8**	**141.3**	**+ 5.6**
Ditcher	124.2	140.8	147.1	+ 4.5
Roller, tandem	144.1	158.3	172.8	+ 9.2
Roller, 3 wheels	129.8	138.7	148.6	+ 7.1
Ripper and rooter	116.7	120.7	132.8	+10.0
Dewatering pump, 10 M gph	100.5	105.4	108.1	+ 2.6
Dewatering pump 90M gph	116.7	124.3	133.3	+ 7.2
Portable Air Compressers	**132.0**	**133.6**	**146.2**	**+ 9.4**
Contractors Air Tools	**125.0**	**135.7**	**150.0**	**+10.5**
Mixers, Pavers, Spreaders	**125.7**	**133.3**	**141.7**	**+ 6.3**
Mixer, port., 11 cu ft	134.1	145.3	150.5	+ 3.6
Mixer, port., 16 cu ft	134.8	144.8	152.6	+ 5.4
Mixer, truck, 4½ cu yd	108.4	113.7	120.1	+ 5.6
Mixer, paving, 34 cu ft	136.9	153.7	166.8	+ 8.5
Concrete finisher	147.5	158.0	166.3	+ 5.3
Bituminous distributor	103.3	108.3	115.9	+ 7.0
Bituminous spreader	137.2	137.2	160.3	+16.8
Bituminous paver	138.8	143.9	149.8	+ 4.1

a Index based on January, 1955 = 100

BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49 = 100

Demand Is High; Prices, Steady

CONTRACTORS CONTINUE to invest heavily in new machines. But for the first month since the middle of 1955 machinery prices failed to record a substantial rise.

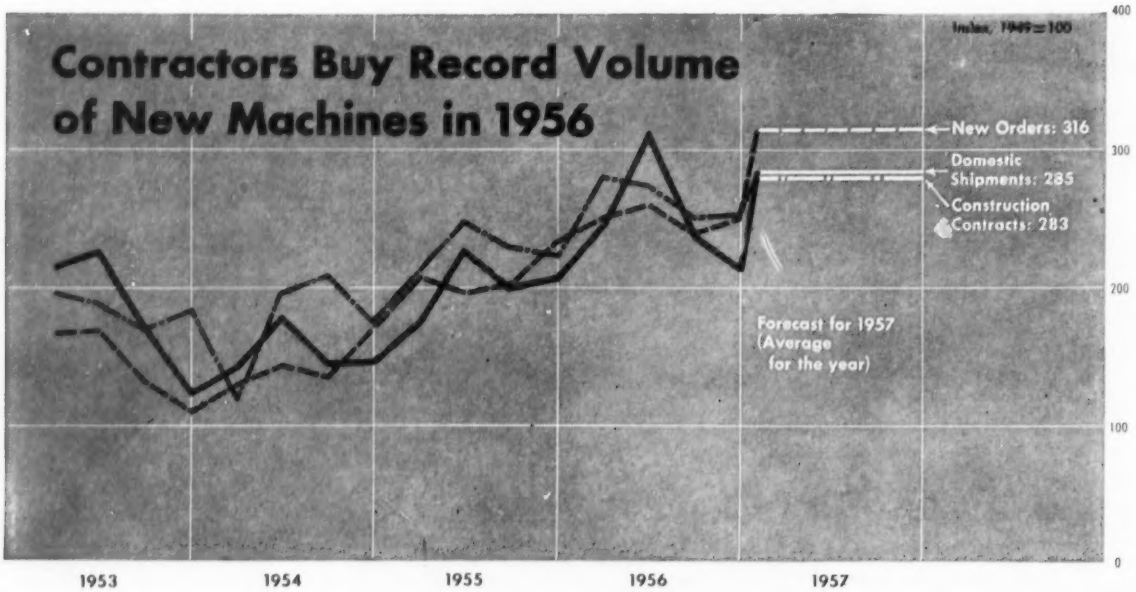
New orders received by manufacturers in January and February were the second highest on record for those two months. Only in 1951 was the total higher. Orders during the first two months of this year stood 12% higher than a year earlier. Even so, they were a little lower than some manufacturers had expected.

One reason is that the 12% increase in the dollar value of the equipment sold during January and February overstates the "real" value of the machines in comparison with the total for the first two months of last year. Machinery prices have increased an average of 9% since this time last year.

Another reason is that some contractors are doing less business this year than last. Most of the decline is in private building construction. Other fields—dams, highways, etc.—are running far ahead of 1956's previous record rate. But the total for all heavy construction is off sharply from last year's super-colossal rate.

Biggest price boosts during the past 12 months have been for crawler tractors, air tools, large power shovels, bucket attachments, and bituminous spreaders.

All major types of machines carry higher price tags than a year ago. But bituminous spreaders lead the list with an advance of 16.8%; clamshell buckets are up 15.6%; small crawler tractors, 13.2%; and dragline buckets, 13%.



Contractors Mechanize At Record Pace

CONSTRUCTION contractors are battling stiffer competition for new work with better mechanization. Construction machinery and equipment poured out of factories to contractors' yards in record volume last year. And 1957 to date is the third straight year of sharply increasing investment in new machines.

CONSTRUCTION METHODS estimates that shipments of construction machines and parts totaling $1,875 million, valued in manufacturers' prices, went to domestic buyers in 1956. This represents a 25% increase over 1955's former record volume of domestic shipments. Adding exports puts the grand total for 1956 at about $2,400 million.

Though domestic shipments continued to drop off in the fourth quarter from the colossal peak in the April-June period (see chart above), they nevertheless set a new high mark for the fourth quarter. Dollar value topped 1955's previous quarter record by 3%.

Contractors' new business and equipment purchases are expected to rise to new heights this year because of big increases forecast for heavy construction other than building. This type of work is booming. In fact, by the end of the first quarter, contractors had taken on 16% more in contracts for this type of work than they did a year ago.

New orders for machines during the first two months of 1957 top a year ago by 12%, according to the McGraw-Hill Department of Economics Index. This, incidentally is close to the 15% rise forecast for the first quarter's new orders.

New orders for machines are gaining over last year even though private building contracts have dropped sharply below the tremendous volume a year ago. The decline in private building has pulled the heavy construction contract total reported by CONSTRUCTION METHODS 21% below the first quarter of 1956.

Construction Machinery Output Tops $1.9 Billion in 1955

	TOTAL OUTPUT 1955	EXPORTS 1955	EXPORTS AS % OF TOTAL OUTPUT
		(thousands of dollars)	
Total Output, (including repair and replacement parts)	**$1,920,052.2**	**$419,592.8**	**21.8**
TYPE OF EQUIPMENT			
Tractors			
Crawler, including accessories and parts	573,954.8	198,148.4	34.5
Contractors wheel type, 100 hp and up, including parts	59,461.0	12,200.0	20.5
Power cranes and shovels, including attachments and parts	397,327.2	51,939.0	13.1
Contractor hoists, locomotive cranes, etc., and parts	42,815.5	4,128.7	9.6
Tractor mounted machinery equipment and parts	232,664.8	45,680.8	19.6
Cutting edges, end bits, dozer, grader blades	16,297.5	622.0	4.1
Motor graders, rollers, maintenance machinery and parts	168,827.6	34,159.2	20.2
Ditchers, trenchers and parts	26,507.8	2,734.5	10.3
Off-highway machinery, hauling equipment and parts	133,542.0	31,872.1	23.9
Mixers, related concrete-bituminous machinery and parts	153,409.3	23,263.5	15.2
Portable crushers and parts	60,887.9	11,013.6	18.1
Miscellaneous machinery and equipment	54,356.8	3,791.0	6.9

Agricultural, Construction, Mining and Oil Field Machinery Division, Business and Defense Services Administration, U.S. Department of Commerce

Better Yardstick of Spending for Machines

For the first time the construction industry has a solid measure of how much new construction

The Engineer's Field Report

CASE HISTORY
LUBRICANT RPM Tractor Roller Lubricant
FIRM Curtis Construction Company, Spokane, Washington

"RPM" gives track roller bushings average life of 6-7000 hours work in sand and dust

RPM TRACTOR ROLLER LUBRICANT extends track-roller and bearing life for Curtis Construction Company, Spokane, Wash., even in toughest service. Bud Burbank, Curtis Master Mechanic, says, "RPM Tractor Roller Lubricant gives our rollers an average life of 6,000 to 7,000 hours, and then bushings are usually good enough to reface and put back in service. We've used RPM Tractor Roller Lube in all our track-type equipment for five years. I like it because it stays in, and makes a good seal that keeps dirt out." D-8 Cat (above), stockpiling sand for paving project, works 16 hours a day 6 days a week in grit and heavy dust, yet track-rollers stay in top condition with little maintenance. Curtis uses RPM Tractor Roller Lubricant in 13 pieces of track-type equipment, a Bucyrus-Erie sheepsfoot roller, and a 10-ton steel wheel roller.

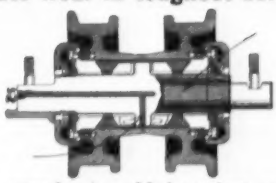
Remarks: There are three grades of RPM Tractor Roller Lubricant to meet all operating conditions in track-roller bearings. For Allis-Chalmers tractors, RPM Tractor Roller Lubricant A/C Type is recommended.

For More Information about petroleum products of any kind or the name of your nearest distributor, write or call any of the companies listed below.

RPM

TRADEMARK "RPM" AND DESIGN REG. U. S. PAT. OFF.

Why RPM Tractor Roller Lubricant resists wear in toughest service



It flows evenly to all bearing surfaces; lubricates and retards rust formation.

Contains chemical anti-wear agent—maintains tough lubricating film.

Has stringiness compound—improved viscosity, resists leakage, helps keep protective grease seal outside bearings.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

machinery, equipment, and parts are being produced. This will also shed more light on how much contractors are investing in new rigs and in maintenance and repair parts.

This first "census" shows 1955 output of 567 manufacturers hit $1,920 million, acording to the Agricultural, Construction, Mining and Oil Field Machinery Division of the Business and Defense Services Administration, U. S. Department of Commerce.

In a month or so, this division of BDSA expects to send out to equipment makers the report form for 1956 output. The results of this report should be available by early fall or perhaps even before. Funds for a third report, covering 1957 shipments are already budgeted. This means three years of good data on how much equipment and parts the construction industry is buying. Previous data has been entirely inadequate.

A further move to improve the figures on how much contractors are spending on equipment is a major revision of the quarterly reports on construction machinery shipments. The division has worked out with manufacturers' help many proposed changes. A task force of industry representatives is being organized to whip the present proposal into final form.

Private Work to Rebound

Contractors can expect the slump in private heavy construction to end soon. Though contracts during the first quarter of 1957 fell 43% below the booming total of a year ago, an upturn is due.

There are two basic reasons to expect this improvement in private work. While contracts have been skidding downward for more than six months, there's been a sharp rise in the volume of new projects entering the planning stage. When plans are completed and financing arranged, the work that's been piling up in the planning stage will move out to construction contract. Though the rise this will create in total private contracts isn't expected to be sensational, it should be enough to close some of the $1.2 billion gap between this year's low volume to date and last year's booming total.

Secondly, construction borrowers are bucking less competition for new capital to finance their projects than they faced six months ago. Borrowers who are able and willing to pay the higher borrowing costs demanded by investors are getting the money they need. In fact, industry and municipal governments are taking in record amounts of new capital for construction this year, and, surprisingly, this has been accompanied by some softening in interest rates, rather than a further rise.

Interstate Program Booms State Highway Awards

Highway contractors have chalked up a record volume of new work so far this year, and the trend continues sharply upward. Contracts awarded during the first quarter zoomed 28% above last year to $701 million, as reported by CONSTRUCTION METHODS. In addition, bridge contracts racked up a 17% gain over a year ago with $171 million in 1957 awards to date.

This is just a sample of the record-smashing volume of highway

PRIME-MOVER M15A FOR BUILDING CONSTRUCTION Places 12 to 17 cu. yds. of concrete per hour on school, hospital and commercial projects — *without* extensive preparations for its use. Runs on same type of ramps, hoists and runways as hand carts. Available with flatbed, or 10 cu. ft. bucket.

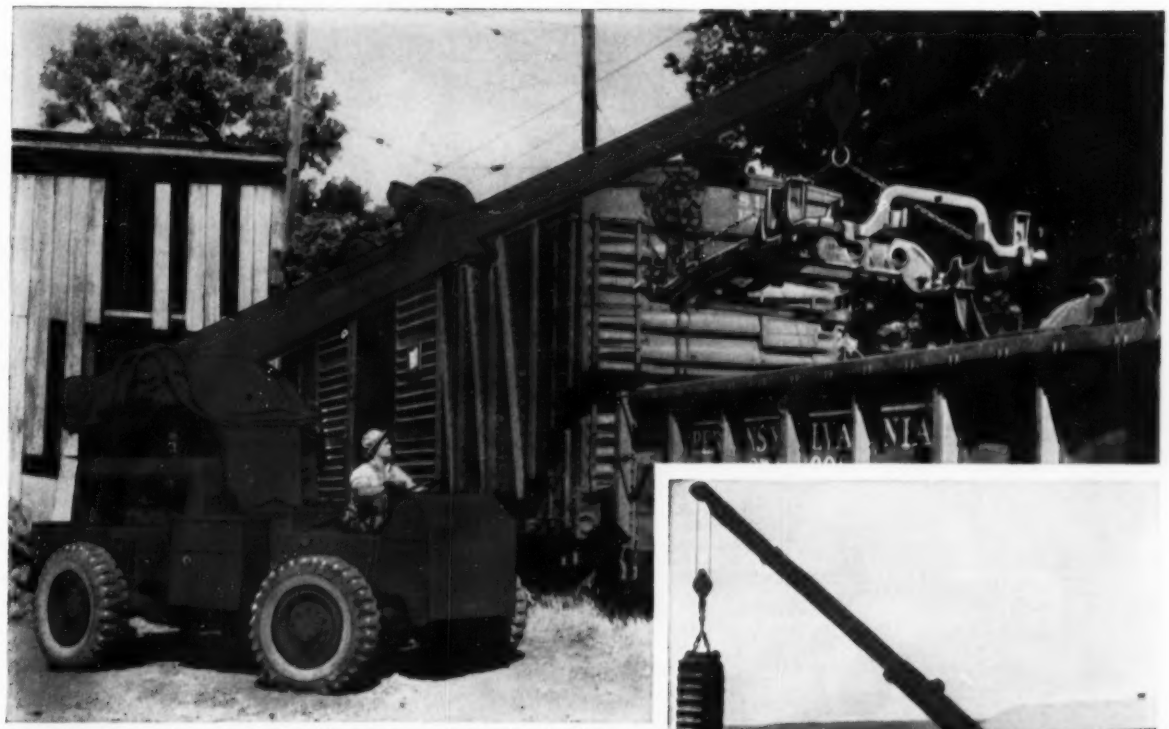
M15A
PRIME-MOVER
M30

FOR HIGH VOLUME, LOW COST PLACING OF CONCRETE AND OTHER BULK MATERIALS — USE PRIME-MOVER POWER!

PRIME-MOVER M30 FOR ENGINEERED CONSTRUCTION

Hauls 2/3 yard or 1-1/2 tons. Unloads transit mixers fast. Spots concrete right where it's needed on plant, warehouse, pier and bridge construction. Hydraulic Torque Converter Drive frees the operator from shifting, clutching and wasted effort. Rugged, dependable. Bucket and flat bed.

FOR COMPLETE DETAILS WRITE TO PRIME-MOVER CO., MUSCATINE, IOWA



A-W's live boom makes it the ideal tool for loading and unloading freight cars.

Here's the most versatile hoisting tool in industry... the A-W HYDRAULIC CRANE

Versatile A-W saves many costly hours of maintenance time.

Combining its unique pickup, carrying and placement capabilities with the best features of other types of cranes, the A-W Hydraulic Crane sets a new standard of performance. Take a look at some of the reasons why it does more jobs better than anything in its class:

Live boom action—The 18-ft. boom is under complete hydraulic control, responds instantly to the operator's touch with smooth, positive action. Rotates a full 360° if necessary. Can extend and lift a live 5-ton load while it pulls, moving forward or backward at the same time. Because it's powered both ways, up and down, you can't drop anything you're hoisting—an important safety feature.

Works indoors and out—Its sturdy, close-coupled chassis with all-wheel steer gives fast travel in and out of buildings and around obstacles. All-wheel drive and oversize tires take it through sand, across rough terrain, over rails with perfect ease. When the going is particularly tough, when storage areas are muddy or snowy, or there are ramps to climb or freight cars to push, all-wheel drive and the torque converter (optional) really do a job.

Easy, low-cost operation—Simplicity is the key-word for the entire operation of the A-W Crane, and anyone can easily learn to operate it in a very short time.

As for costs, this is the report of a typical user: "The daily machine cost of $11.11 is less than one hour's payroll of the six men this tool assists. With it, they are able to do a job in half the time. Very conservatively, our hydraulic crane is returning 100% a year on our investment."

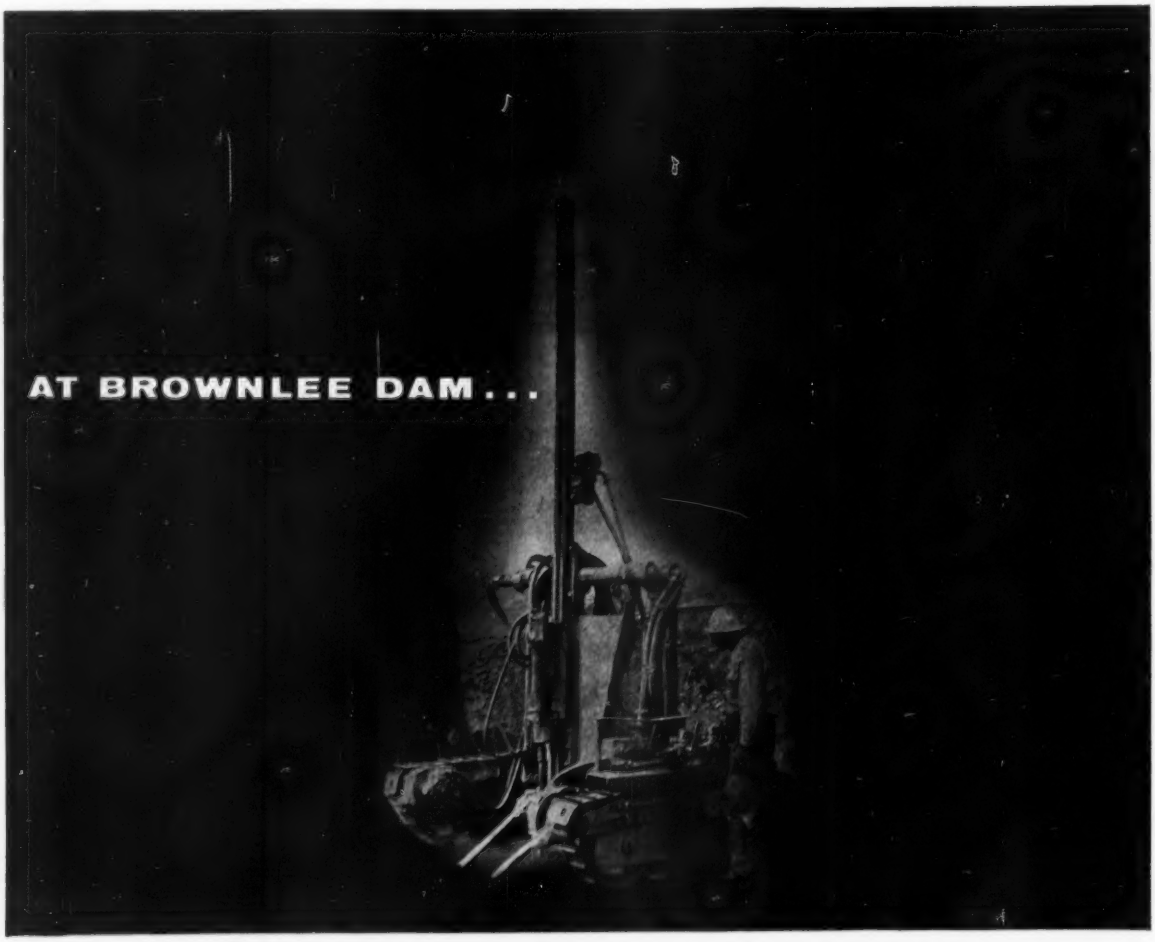
Ask your nearby A-W distributor to tell you all about the time- and money-saving advantages of this remarkable machine. Or write direct to Austin-Western, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Aurora, Illinois.

Write for Data Book 2253—full of facts on working ranges, boom extensions, minimum aisle widths, tractive effort, towing capacity, and special attachments.

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes

BALDWIN BLH LIMA-HAMILTON

AUSTIN-WESTERN WORKS
BALDWIN-LIMA-HAMILTON
Construction Equipment Division
OTHER DIVISIONS: Eddystone • Lima • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Standard Steel Works • Madsen • Pelton
AURORA, ILLINOIS, U.S.A.



A VARIED SCHEDULE . . . A VERSATILE DRILL

THE *Joy* JUNIOR CHALLENGER

Monday	**10:30 a.m.**	Drilled 4 vertical holes—26′ deep finished by 12:15 p.m.
	1:00 p.m.	Moved to lower level . . . drilled one hole 22′ deep, 3″ diameter.
	2:00 p.m.	Moved drill to high ground to drill horizontal holes.
	4:00 p.m.	Drilled 2 horizontal holes in shattered rock at high location . . . 22′ deep—finished 5:00 p.m. Quit for blasting.
Tuesday	**7:00 a.m.**	Moved to lower level. Began drilling 4″ dia. angled holes beside other drills drilling 2⅞″ dia. holes. Other drills pulled off location for inability to penetrate clay in a water course at 15′. Drilled 11 holes, 24′ deep, in 6½ hours of 9-hour shift.
	Everyday:	The Challenger drills anywhere, in any position, in any formation . . . and stays on the job. This particular machine runs 20 hours a day, 6 days a week and averages 540 feet of 3″ hole per day. Get complete details on the Junior Challenger from ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

WRITE FOR FREE BULLETIN 145-23

JOY . . . EQUIPMENT FOR CONSTRUCTION . . . FOR ALL INDUSTRY

PORTABLE COMPRESSORS

WAGON DRILLS

ROCK DRILL BITS

HAND-HELD ROCK DRILLS

WSW C6423-14B

CONSTRUCTION BUSINESS...
continued

contracts to be let this year. State highway departments have budgeted tremendous increases in contracts for 1957. A tally of early returns from 38 states and the District of Columbia reporting back on the CONSTRUCTION METHODS annual state highway budget survey indicates a 36% jump in contracts this year. These state budgets add up to $3,400 million in contracts for the free highway system—that is, excluding toll roads. The total will go much higher when the budgets are added for states that have not yet reported, including such key states as New Jersey and Florida.

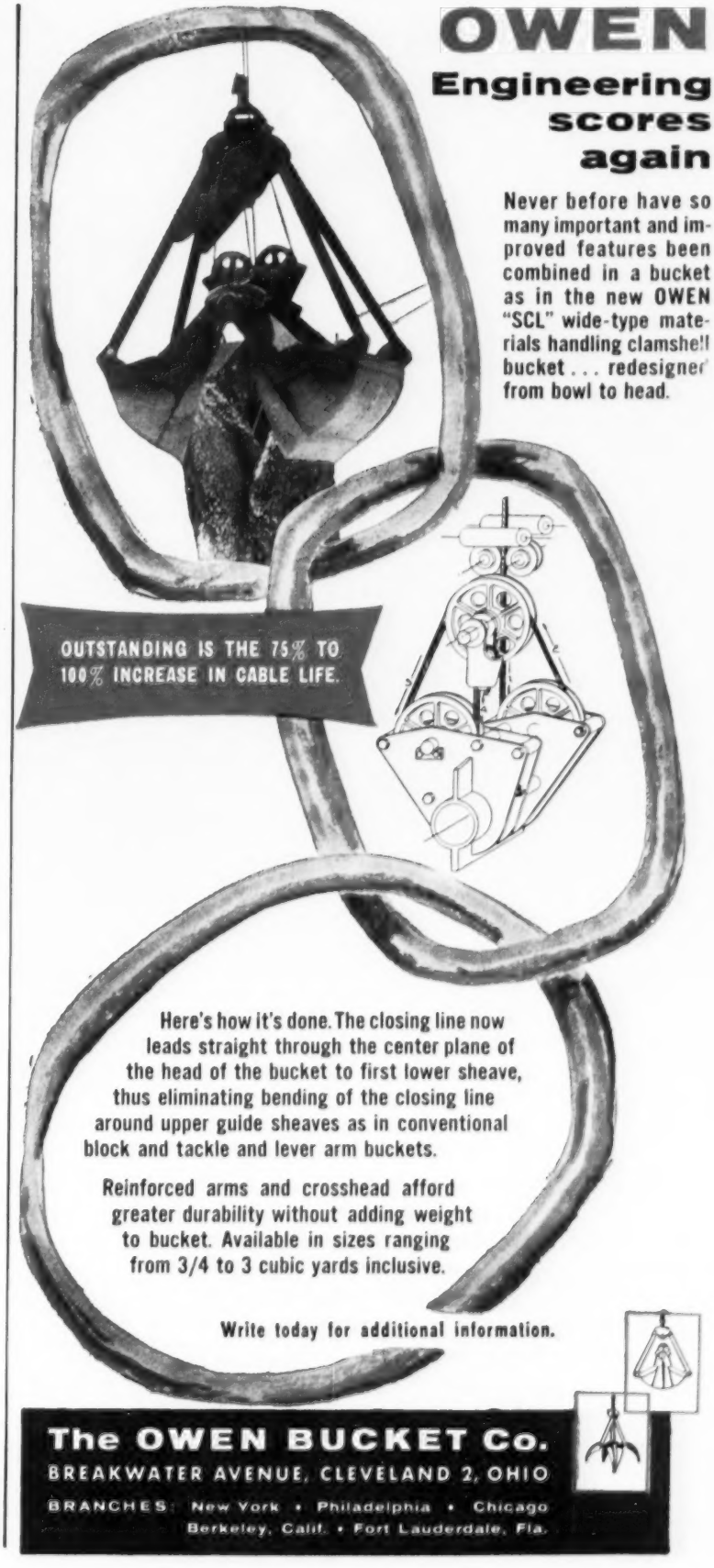
Interstate highway system projects account for $1,600 million, about half of the total 1957 construction contracts budgeted by these 39 highway departments. This means that interstate projects will be responsible for all of the over-all rise in this year's state highway contract budgets. It also means that contracts for non-federal-aid free highways and for "50-50 basis" federally aided primary, secondary, and urban highways will be lower in this year than in 1956.

However, even though the states are putting the emphasis on interstate projects for which they pick up only 10% of the tab, contracts for other types of state highways will be substantial. For instance, contractors in January took on $99.3 million in awards for federal-aid highways outside the interstate system, according to Bureau of Public Roads figures. Though this was down 11% from a year ago, it wasn't much below the $109 million in interstate contracts let in January. Furthermore, more contracts for free highways without federal aid were awarded by the states in January, 1957, than in January, 1956.

Ohio leads all other states that have reported so far in the total budgeted for highways. Ohio has budgeted $350 million in contracts to be let this year for its free highway system. Of this, $240 million will be for interstate projects.

Among the other top states—with $150 million or more in contracts budgeted for their free systems this year—are New York, Texas, California, Pennsylvania, Michigan, and Illinois.

The complete results of this 1957 state highway budget survey will be in the May issue of CONSTRUC-

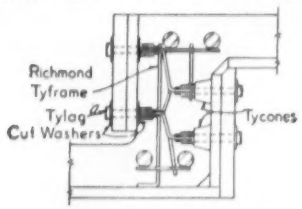

OWEN
Engineering scores again
Never before have so many important and improved features been combined in a bucket as in the new OWEN "SCL" wide-type materials handling clamshell bucket . . . redesigned from bowl to head.
OUTSTANDING IS THE 75% TO 100% INCREASE IN CABLE LIFE.
Here's how it's done. The closing line now leads straight through the center plane of the head of the bucket to first lower sheave, thus eliminating bending of the closing line around upper guide sheaves as in conventional block and tackle and lever arm buckets.
Reinforced arms and crosshead afford greater durability without adding weight to bucket. Available in sizes ranging from 3/4 to 3 cubic yards inclusive.
Write today for additional information.
The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

Memorial Stadium, home grounds of Baltimore Orioles, prior to pouring of upper deck stands behind home plate. Stadium contractors: DeLuca & Davis — Contractors for addition: Joseph F. Hughes & Co.

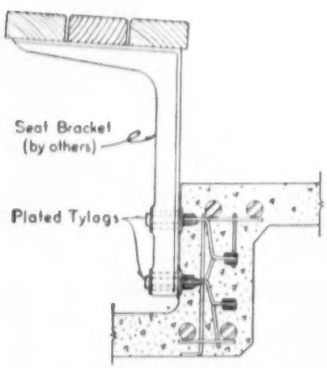
Two birds with one stone

20,000 Richmond Tyframes do double duty in Orioles' stadium

When the American League Orioles needed a larger nest, the seating capacity of Baltimore's Memorial Stadium had to be expanded. By using Richmond Tyframes in the building of additional stands, the contractors were able to "kill two birds with one stone":



FIRST the Tyframes held the riser forms rigidly in place, without need for raking timbers or other external bracing;



LATER the Tyframes provided anchorage for the seat brackets, which were bolted to the Tyframes by means of Plated Tylag Bolts.

This same Richmond Tyframe method was used in construction of the original stands. Standard Richmond Tyframes come in two varieties—either four coils welded to a trusslike arrangement of wire struts; or Tyloops —sometimes with Tyscrus—welded to a strong vertical support member. Each has a leg at the front face extending to the soffit to support the riser form. Sloping-Slab type Tyframes—two bent Tyscrus welded to a wire truss that exactly positions the coils and supports the riser forms—are used when the underside of the stands is sloping rather than stepped.

Richmond Tyframes with seat brackets applied to concrete block have been load-tested to 10,640 lbs. and 13,610 lbs.—we'll gladly send you the test data on request. Tyframes are used for many kinds of concrete construction besides stadiums—curbing, stair risers, balconies, gymnasium seating and such special work as supporting fascia beam forms above a monolithically poured marquee or other projection.

Full technical details of Richmond Tyframes are given in the new Richmond Handbook, which covers the complete line of Richmond-engineered tying devices, anchorages and accessories—all designed to enable you to place concrete better, more quickly, and more economically. For your copy, write to: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 So. Fourth St., St. Joseph, Mo.

CONSTRUCTION BUSINESS...

continued from page 27

TION METHODS. In addition, toll road contract budgets for this year also will be reported next month.

At the eight months mark of the program, February 28, contractors had signed up $441.5 million in interstate highway construction contracts. These awards included 791 miles, and the average total cost per contract awarded was $1,425,000, according to Bureau of Public Roads figures.

New York set the pace during this period by awarding $90 million in contracts. Ohio was second with $51 million, and Texas was third with nearly $43 million. A total of 43 states had let at least one contract on the interstate system during this period. Texas was way out in front with 43 projects awarded.

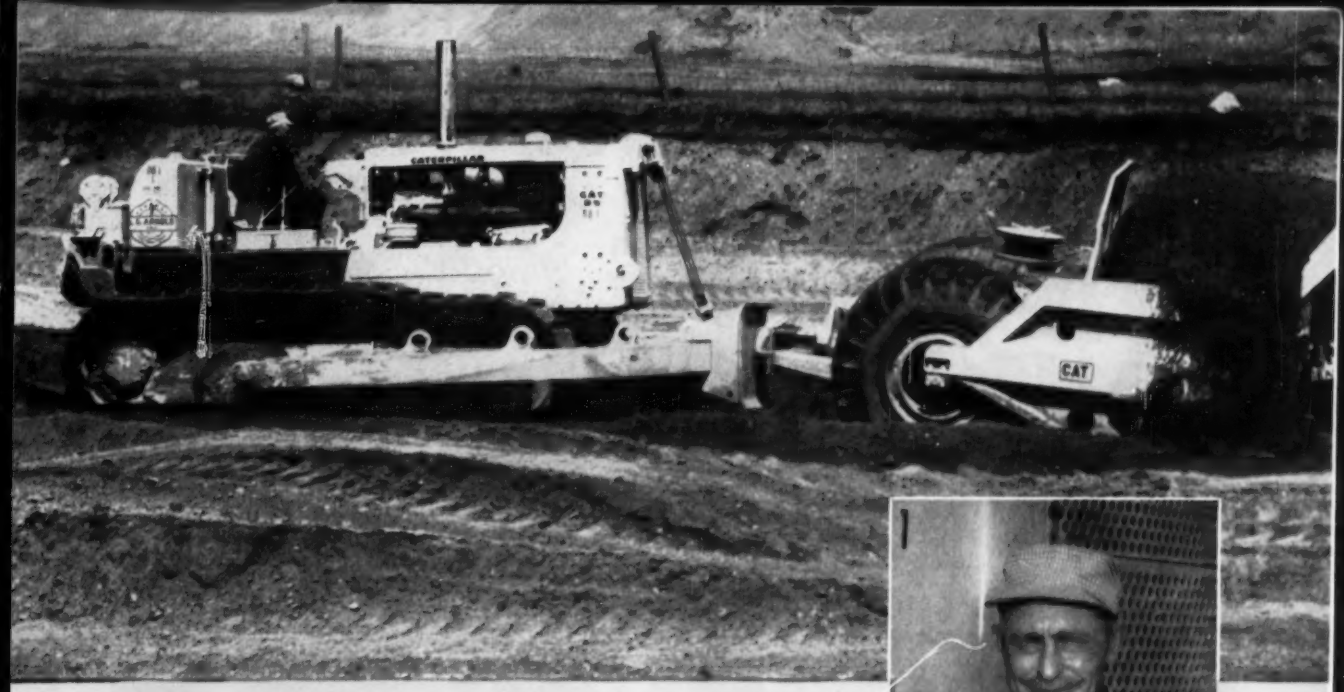
Only Delaware, Kentucky, Nebraska, Vermont, and West Virginia are missing from the roster of states that had awarded some interstate contracts by the end of February. But they'll be joining the parade soon. That's because the 1957 contract budgets reported by four of these states (Delaware isn't in yet) show they plan to award contracts for interstate projects this year totaling from $6.5 million by Vermont to $23 million by West Virginia.

SOME BIG CONTRACT AWARDS OF THE MONTH

George A. Fuller Co., 597 Madison Ave., New York, N.Y. Fifty-two story office, Madison, Park Aves., 47 and 48 Sts., New York, N.Y. Union Carbide & Carbon Corp., 30 E. 42 St., New York 17, N.Y. $40,000,000.

Arthur G. McKee Co., 2300 Chester St., Cleveland, Ohio. Blast furnace in Ashland, Ky. for Armco Steel Corp., Middletown, Ohio. $20,000,000.

T. L. James & Co., Box 531, Ruston, La. Taxiway and aprons paving at Naval Auxiliary Air Station, NBy 6394, New Iberia, La. Officer in Charge of Construction, Eighth Naval District, Building 16, U.S. Naval Station, New Orleans (Algiers), La. $8,775,600.



BEAR IN THE BORROW PIT

THIS D9 LOADS SCRAPERS WITH 25 HEAPED YARDS IN 45 SECONDS

Phil Dudenhoefer, grade superintendent, knows from production charts that the D9 pusher loads more yards faster, at lower cost.

Working on a highway relocation job near Eau Claire, Wis., L. G. Arnold, Inc., cut cycle times and boosted yardage with a Caterpillar D9 Tractor push-loading a CAT* DW21 and No. 470 Lowbowl Scraper.

On a round-trip haul of 3 miles they averaged 100 cu. yd. per hour — 4 heaped loads of 25 cu. yd. each. Loading time in the borrow pit, with the mighty D9 pushing, was an average of only 45 seconds.

Phil Dudenhoefer, grade superintendent for L. G. Arnold, Inc., says: "I've got both feet right in the dirt, where I record output and performance of every machine. With the D9 as pusher, the DW21-No. 470 unit is outproducing by far any other equipment on the job."

That experience has been shared by hundreds of firms, as more and more D9 Tractors have gone to work all over the country. For fast loading you simply can't beat the D9, with its 320 HP at the flywheel and maximum drawbar pull of 98,000 pounds. Power-boosted controls and excellent visibility make this giant one of the easiest of all tractors to operate. Available either with torque converter or direct drive with oil clutch. Maintenance is easy, too. And it's ruggedly built to lick the world's toughest jobs.

Your Caterpillar Dealer can show you actual performance records of bigger production at lower cost per yard. He'll give you a demonstration right on the job. And he stands behind the long life of every machine with reliable service and parts you can trust.

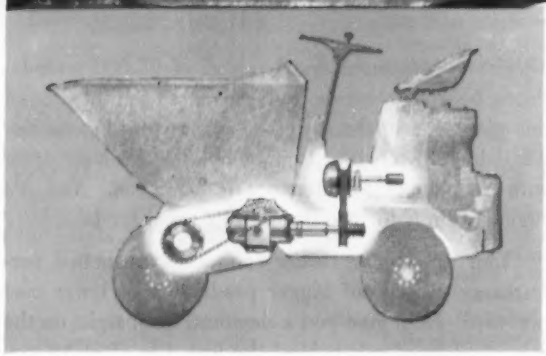
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

HEAVY-DUTY EARTHMOVERS FOR THE HARD WORK

Here's a low-cost lift for



NO CLUTCHING — NO SHIFTING — Big R-15 Moto-Bug now has *automatic power-flow* transmission. All travel is controlled by foot accelerator. You get low speed with high engine torque when maximum pulling power is needed — plus infinite, *smooth* speed changes up to 12 m.p.h. Just set directional travel lever into forward or reverse — step on the accelerator — and go.

3 TOOLS IN ONE — Both sizes of Moto-Bugs, R-15 (at top of page) and this smaller S-10 give you flat-bed, power wheelbarrow and fork lift versatility. Maneuverable, light-weight S-10 carries 1500 pounds on 4-foot platform, has 10 or 15 cu. ft. hopper body, ½-ton (6-foot) fork lift, all these attachments are quickly interchangeable for diversified material-handling.

KWIK-MIX *multiple-tool* MOTO-BUG®

your jobs

Have you checked recently into the steadily-rising costs of all your small, time-consuming material handling chores? There's a practical answer in *multiple-tool* Moto-Bug. It brings you power wheelbarrow, fork lift, flatbed service all in *one* low-cost, interchangeable unit that hauls, lifts, loads, unloads and stacks all kinds of materials, supplies.

Lifts ¾ ton — Big, 4-wheel R-15 Moto-Bug with fork lift attachment handles 1500 pounds, at 15-inch load center, and 7-foot height. Forks are 24 or 30 inches long, adjustable 6 to 32 inches wide for pallets, barrels, crates. Hydraulic power raises and lowers the load — tilts the mast 2° forward, 10° back for load pick-up, carry, and release.

Hauls 1 ton— Gravity-dump hopper body converts the R-15 Moto-Bug into a big-capacity power wheelbarrow. It carries up to 2000 pounds of any bulk materials in 15 or 18 cubic foot hopper — takes a full batch of concrete from 11-S or 16-S mixer. Change to 4½-foot platform, and you have a heavy-duty 1-ton truck. What's more, there's 780-lbs. of drawbar pull for towing wagons or carts.

Climbs 25% grades — You get a high rate of production with every attachment, because the R-15 travels at speeds to 12 m.p.h. forward and *reverse* — climbs 25% ramps with full 1-ton hopper load. There's no clutching, no shifting. A simple, *power-flow* transmission *automatically* regulates power output in direct relation to speed and grade requirements. All travel is controlled by foot accelerator. Better check how you can save time, work and money with a material-handling Moto-Bug on your jobs. See your Kwik-Mix distributor — or write to us *today*.

KWIK-MIX DIVISION
KOEHRING COMPANY
Port Washington, Wisconsin

CKN753

Other Kwik-Mix products: concrete, plaster-mortar, bituminous mixers.

Dig 6 feet wide with 310 Trenchliner®

Equipped with dual booms, big-capacity 310 Trenchliner digs 6-foot trench at depths to 12 feet. With single boom it has 1½ to 4½-foot widths, and 17-foot maximum depth. Digging speeds range from 5 inches to 20½ lineal feet per minute. Power-shift spoil conveyor discharges to either side of machine. There's full reverse of all operations for undercutting, making vertical setins. Parsons line also includes smaller heavy-duty trenchers.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

Lo-Bin® for batching or transit-mix

As a batch plant, Johnson Lo-Bin can be arranged with 2, 3 or 4 aggregate compartments. For transit-mix, one compartment can be used for bulk cement. It has 22 or 44 cu. ft. batcher, up to 4 weigh-beams. Batcher rides out beyond end of bin, dumps onto conveyor, or mixer skip (serves 6-S to 28-S mixers). Lo-Bin has 8, 20, 30-ton capacity, is only 7½ to 9½-ft. high — easily charged by tractor loader. Optional: wheels, tires, tow-bar.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)

86.7 batches per hour with 34-E *twinbatch*®

Koehring 34-E paver hits a top output of 86.7 batches per hour (60-second mixing time). This reserve work capacity offsets normal production delays . . . assures an average of 50 batches an hour, 8 hours a day, at no increase in batching, hauling or finishing equipment. Every mixing operation is automatic, accurate, fast with split-second Autocycle control. Get more facts on big Koehring 34-E *twinbatch*. Also check rubber-tired 16-E.

KOEHRING Company
Milwaukee 16, Wis.

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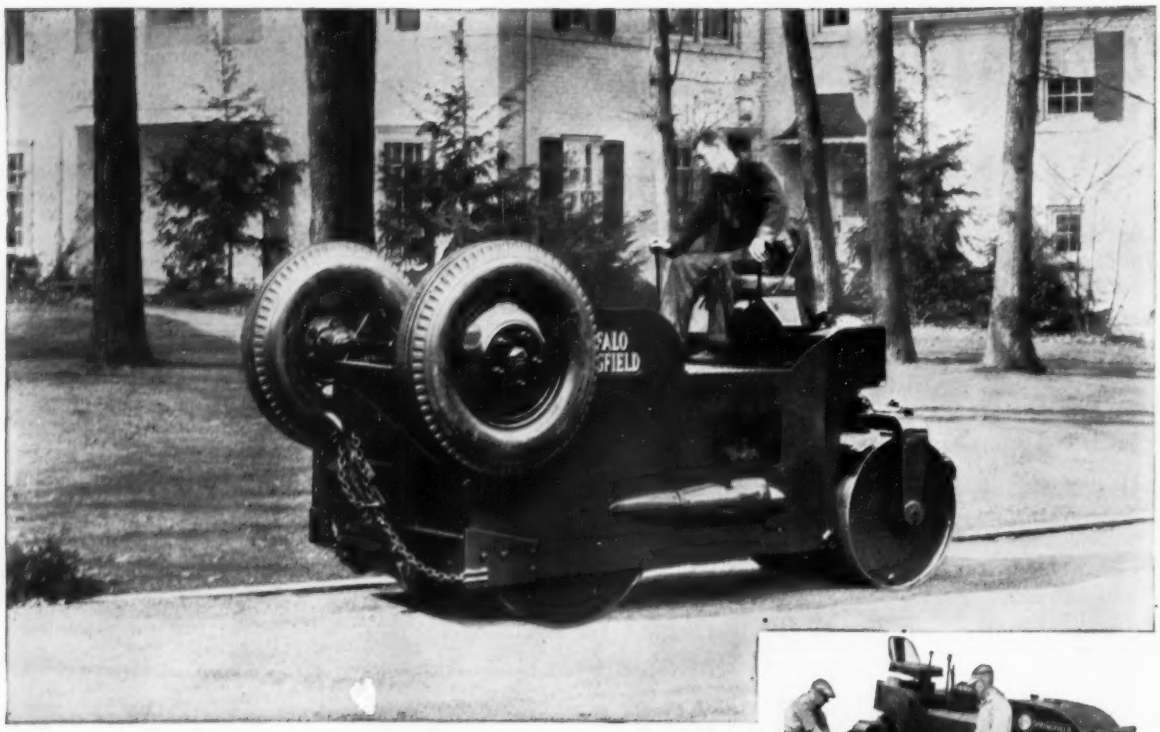
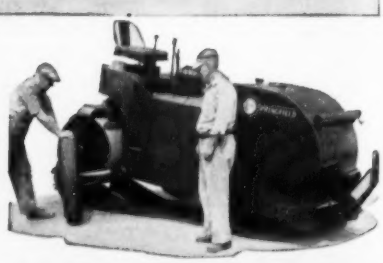
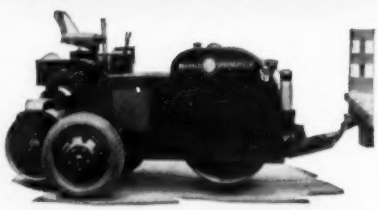




The Roller is easily rigged for towing. Inclined wooden blocks are provided for raising guide roll to slip on road wheels and pin them in place.



Towing hitch is quickly engaged with pintle on towing vehicle. Hand-operated hydraulic jack installed as part of the towing attachment is employed to raise the drive roll off ground.

For heavy-duty rolling *PLUS PORTABILITY...use this* BUFFALO-SPRINGFIELD Roller

A conventional heavy-duty roller in construction and performance, this 3-5 ton Tandem Roller, when equipped with the Towing Attachment*, is easily transported from job to job. All essential design features of the larger Buffalo-Springfield tandems, *plus portability*, make this particular roller especially popular for handling a large variety of smaller rolling jobs.

Driveways, sidewalks, parking and playground areas, patching and light finishing work are finished fast . . . and the Portable roller is ready for new work at a different location, with minimum time lost.

Rubber tired road wheels are carried out of the way, on a bracket over the drive roll. When the roller is working, there are no tire treads to mar surface materials or produce uneven surface compaction. For heavy-duty roller performance, plus the economy of using *one* roller quickly at scattered locations, get a Buffalo-Springfield *Portable* Tandem Roller.

See your Buffalo-Springfield distributor now, or write for Bulletin S-58-49 for complete details.

*Towing Attachment is available as optional equipment.

BUFFALO-SPRINGFIELD ROLLER CO.
DIVISION OF KOEHRING COMPANY · SPRINGFIELD, OHIO

B.F.Goodrich

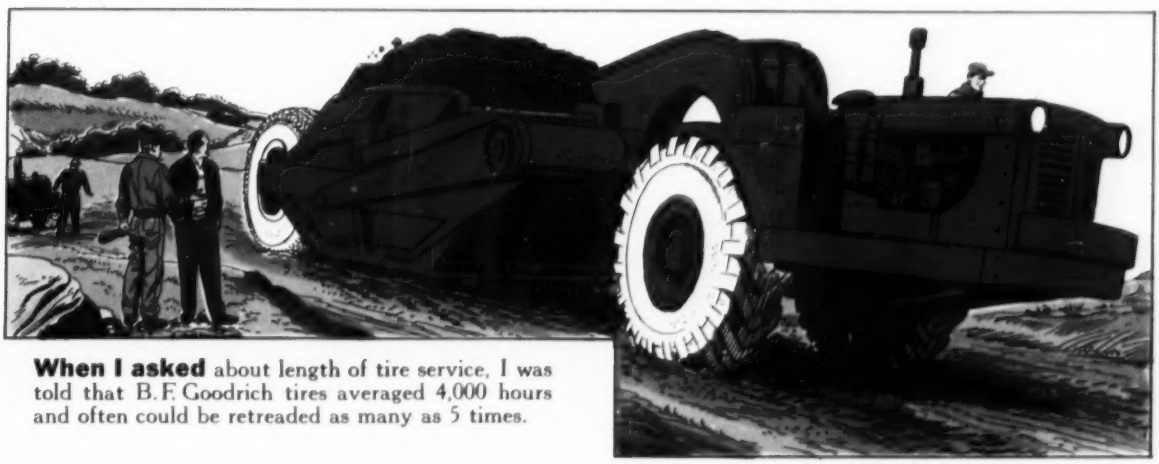
job inspection tour with Bill, your traveling B. F. Goodrich reporter

Building a turnpike

S. J. Groves & Sons Co. equipment was at work on the Indiana Turnpike near Howe the day I visited them. This world-wide contractor was using fleets of graders, scrapers, tractors, oil trucks and compactors 120 hours a week.

I found that sandy soil made the going tough for earth movers carrying 16-yard loads. But the company reported that B.F.Goodrich Super Traction tires were doing an exceptional job. Altogether, they said, they were using 7 different types of B. F. Goodrich tires.

B. F. Goodrich all-nylon tires have done a great job of reducing "down-time" to a minimum, and that means lower operating costs and increased efficiency, they reported.



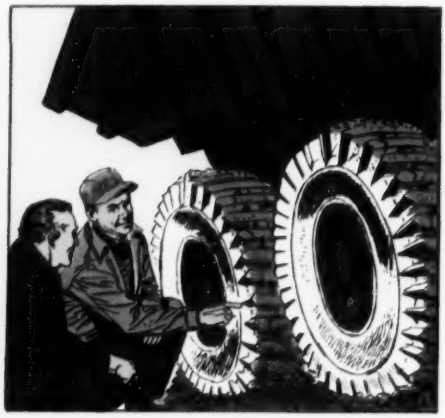
When I asked about length of tire service, I was told that B.F.Goodrich tires averaged 4,000 hours and often could be retreaded as many as 5 times.

more

Hauling sto

Jernigan Trucking Co. operates 17 trucks in and around Augusta, Georgia. In addition to stone, the trucks carry 8 to 20 tons of asphalt, top soil, sand and gravel. Trucks work year 'round, says owner A. C. Jernigan, but busiest times are in the summer when temperatures go well over 100°.

Hauling stone over back-country roads for Little River bridge approaches was a problem for Jernigan. Giant loads of stone and rocky, rutted roads caused even new tires to blow out and fail within 30 days or less. After Jernigan switched to B.F.Goodrich *all-nylon* All-Purpose tires, they had no more blowouts. Competitors who did not switch continue to have trouble.



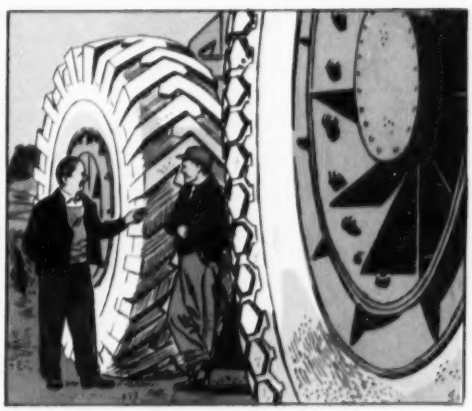
Many B.F.Goodrich *all-nylon* All-Purpose tires have gone over 50,000 miles —an all-time record on this operation.

"Tire cost is important, but we find the best tire is the cheapest in the long run," Office Manager H. B. Leonard told me. "And we get every dollar's worth out of a B.F.Goodrich *all-nylon* All-Purpose tire."

Earth moving

I found O'Connor Construction Co. tractors and 13-yard scrapers at work clearing a right-of-way in central Illinois. Tires carry a payload of over 22 tons, plus equipment weight.

O'Connor Construction Co. relies on B.F.Goodrich road service to keep its 110 *all-nylon* Super Traction and 40 Universal tires always ready for work. The tread designs are ideal for the job and give good all-around traction.



"Keeping on schedule is important on this earth-moving job," the general superintendent told me. "We're turning this old road into a 4-lane highway."

B.F.Goodrich tires work 3,000 hours on the original tread, the superintendent said, then are retreaded and give an additional 3,000 hours of service.

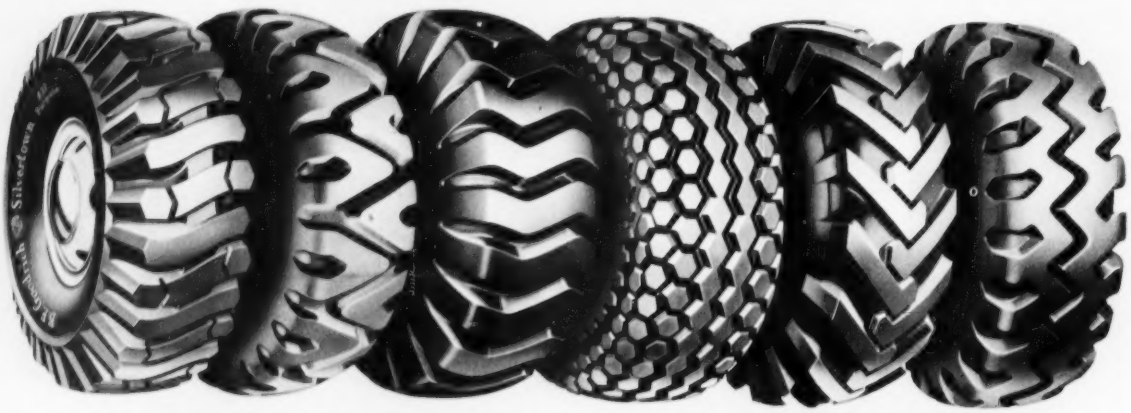
more

Whatever your job... Wherever you work...

B.F.Goodrich

road service is as close as your phone

THERE'S A B. F. GOODRICH TIRE FOR EVERY OFF-THE-ROAD JOB



All-Purpose tires work on paved or dirt roads or in the rough on such jobs as logging, sand and gravel hauling, excavating, etc. *All-nylon* or rayon construction. Sizes 6.00-16 through 12.00-24.

Universal tires are designed for power wheels on trucks and tractors that pull trailer equipment or for free-rolling wheels in severe service. *All-nylon* construction. Sizes 7.00-15 through 24.00-29.

Rock Service tires are designed for mining, quarrying and dirt-moving operations. Newest BFG tire. *All-nylon* cord body in tubeless or conventional construction. Sizes 12.00-24 to 33.5-33.

Earth Mover Traction tires are designed for free-rolling wheels on scrapers, earth-moving wagons and other pulled equipment. *All-nylon* construction. Sizes 14.00-20 to 24.00-29.

Super Traction tires work on drive or free-rolling wheels of dirt-moving rigs. *All-nylon* construction, sizes 18.00-25 to 24.00-29. **Tractor Grader** type, sizes 9.00-24 to 18.00-26.

Rock Logger tires are built for drive and front wheels on dump and logging trucks, cement mix trucks, quarry and construction machinery. *All-nylon* construction. Sizes 8.25-20 to 14.00-24.

Any one of the following B.F.Goodrich zone offices will arrange service • *Phone the one nearest you*

Atlanta, Ga.	DR 8-4561	Denver, Colo.	TA 5-1267	Memphis, Tenn.	WH 8-6761	Phoenix, Ariz.	AL 3-6168
Charlotte, N.C.	ED 4-3066	Detroit, Mich.	TY 5-8850	Minneapolis, Minn.	FE 2-5474	Pittsburgh, Penna.	HI 1-5200
Chicago, Ill.	ES 8-8800	Houston, Texas	CA 7-5228	Needham, Mass.	NE 3-5815	St. Louis, Mo.	PR 3-2600
Cincinnati, Ohio	BR 1-7800	Jacksonville, Fla.	EL 6-4167	New Orleans, La.	CA 6341	Salt Lake City, Utah	DA 2-2405
Cleveland, Ohio	PR 1-0827	Kansas City, Kan.	MA 1-4400	New York, N. Y.	OR 9-0330	San Francisco, Calif.	AT 2-9620
Dallas, Texas	RI 1-5601	Los Angeles, Calif.	RA 3-6111	Philadelphia, Penna.	JE 5-5800	Portland, Oregon	CA 3-3621

Free! Directory of B.F.Goodrich Truck Tire Distributors — nation-wide listing of the names, addresses and phone numbers of BFG distributors who offer road service — and B.F.Goodrich Truck Operators Handbook — facts and figures on BFG tires, load and inflation tables, maintenance tips, etc. Send for your FREE copies today!

B. F. Goodrich Tire Co.
A Division of The B. F. Goodrich Co.
500 S. Main Street, Akron 18, Ohio

Please send me a FREE copy of:

☐ Directory of B. F. Goodrich Truck Tire Distributors
☐ B. F. Goodrich Truck Operators Handbook

Name_____

Company _____

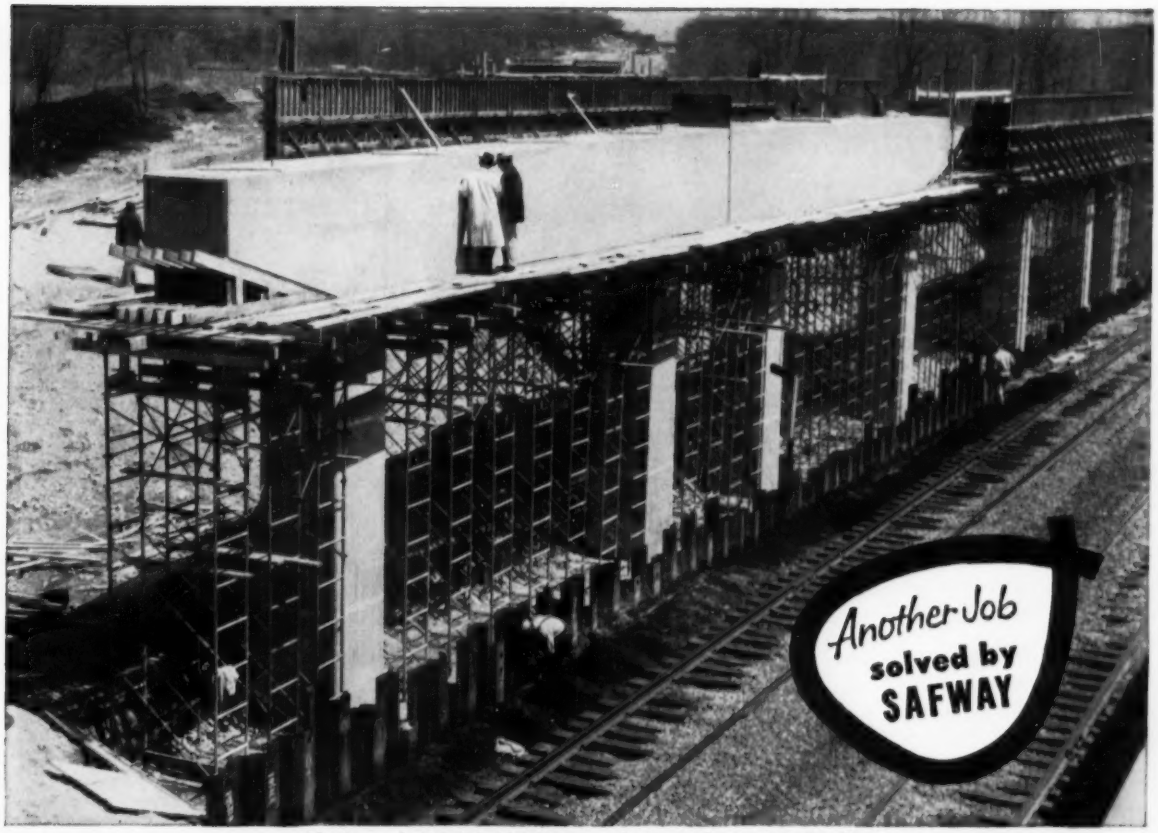
Address _____

City_____ Zone_____ State_____

Specify B. F. Goodrich tires when ordering new equipment

B.F.Goodrich
FIRST IN RUBBER

Your B. F. Goodrich dealer is listed under Tires in the Yellow Pages of your phone book



Shoring a 4'x6'x87' Bridge Beam on the Massachusetts Toll Road

Bridge Shoring Method Saves 60%

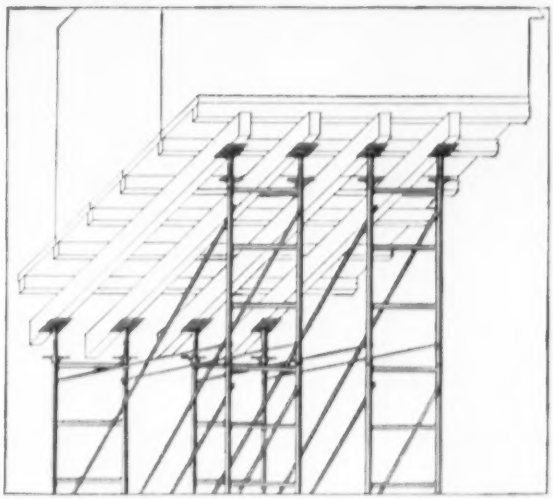
SAFWAY STEEL FRAME SCAFFOLD CUTS TIME AND MATERIAL COST

THIS 4 BY 6 FT. BEAM was shored with Safway steel scaffolding for faster handling, greater convenience, safety and lower ultimate cost. And overall savings amounted to about 60% of the cost of ordinary timber shoring, according to the M. De Matteo Construction Co., who handled the job.

Loads are carried on the tubular steel legs of the scaffolding, braced in two directions. Careful calculation established the number of scaffold frame legs and size of wood beams and joists required to support the concrete. Extended platforms made it easy for men to set and strip side forms.

Safway scaffolding goes up quickly, without tools. Screw jacks compensate for uneven ground and permit final leveling of formwork. As work progresses, complete shoring towers can be moved without disassembly. And the contractor recovers 100% of his scaffold equipment.

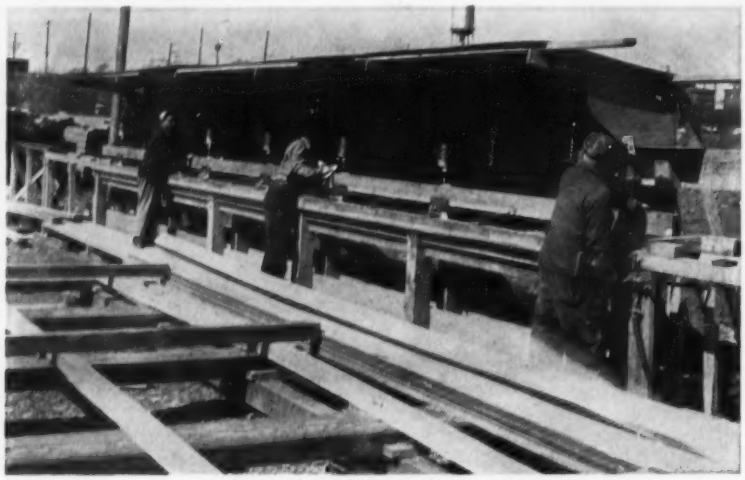
CONSULT SAFWAY ENGINEERS—Learn how you can cut shoring costs! Call your nearby Safway office for planning and erection service—ample stocks are available for *sale* or *rental*. Submit job details for recommendations (no obligation). And **WRITE TODAY FOR BULLETIN 24.**



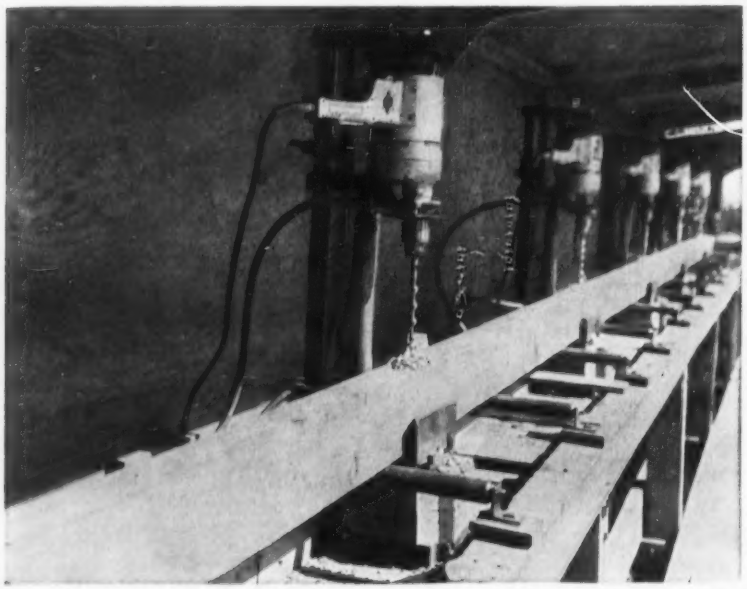
Proper spacing of shoring columns is determined by total load and capacity of the lumber. Safway scaffold frames are available in a number of sizes to meet every spacing requirement, permitting beam loads to be carried directly on column legs rather than horizontals.

SAFWAY
STEEL PRODUCTS, INC.
6243 W. State St., Milwaukee 13, Wis.

Job Talk . . .



LONG TIMBER is rolled into position under multiple drill. Operator at right pushes switch which starts seven heavy duty ¼-in. drills through 40-ft piece of lumber.



AIR CYLINDER feeds drills into timber. Simple 2-way air valve controls feeding and withdrawing. Steel plates hold piece in position during drilling.

Multiple-Drill Rig Handles Heavy Timbers

A multiple-drill setup for drilling holes through 40-ft fir stringers is speeding form construction on a section of the St. Lawrence Seaway. At the St. Lambert Lock and approaches near Montreal, McNamara-Pigott and Peacock Construction Co. have set up seven Stanley electric heavy-duty ½-in. drills. Equally spaced in series, they are held by heavy, mobile stands that can be adjusted vertically and horizontally. Timber in sizes to 3x12 is moved onto the roller table from a stock pile on the left of the drilling line. Beneath each drill, fixed iron plates channel the stringers into correct drilling position.

All drills are operated by one man. When a stringer is set for

continued on page 42

For more details about the...

NEW GUARANTEED AVAILABILITY PLAN

see a participating Blue Brute distributor

ALABAMA
Ben Williams Equipment Company—Andalusia
H. S. Salmon & Company—Birmingham
CALIFORNIA
West Coast Engine & Equipment Co.—Berkeley
LeRoi-Rix Machinery Company—Los Angeles
L. E. McDowell Co.—Richmond
H. P. Kingsley Company—San Bernardino
Vern & Flynn's Rental Service—San Carlos
Kenton Equipment Company—San Diego
COLORADO
Power Equipment Company—Denver
CONNECTICUT
Construction Equipment Company—Wilson
FLORIDA
Julien P. Benjamin Equipment Co.—Jacksonville
A. W. Thomas Construction Machinery—N. Miami
Highway Equipment & Supply Co.—Orlando
GEORGIA
Tractor & Machinery Company—Atlanta
ILLINOIS
Riverside Sales Contractors Equip.—Brookfield
Capital Tractor & Equip. Co.—Morton, Springfield
INDIANA
Reid-Holcomb Co.—Indianapolis, Evansville, South Bend
KANSAS
Southwest Equipment Company—Dodge City
MAINE
N. A. Burkitt, Inc.—South Portland
MARYLAND
Elphinstone, Inc.—Baltimore
Free State Equipment Co.—Baltimore
Washington, D. C.
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Morrissey Brothers Tractor Company—Burlington
Northampton, Woburn
MICHIGAN
Great Lakes Equipment Company—Muskegon
MINNESOTA
Minneapolis Equipment Company—Minneapolis
MONTANA
Caird Engineering Works—Helena
NEW HAMPSHIRE
New Hampshire Explosives & Machinery Co.—Concord
NEW JERSEY
Miller Equipment Company—Dunellen
American Air Compressor Corp.—North Bergen
NEW YORK
Murray Construction Equipment Co.—Buffalo
Heil Equipment Company—Long Island City
NORTH CAROLINA
Spartan Equipment Company—Charlotte
OHIO
Brinker Supply Co.—Cleveland, Columbus, Dover
Beasley-Holmes Company—Toledo
OREGON
Western Equipment Company—Eugene, Portland
PENNSYLVANIA
American Equipment Co.—Mechanicsburg
Metalweld, Inc.—Philadelphia
RHODE ISLAND
BMG Equipment Company—Providence
SOUTH CAROLINA
South Carolina Equipment Co., Inc.—Columbia
SOUTH DAKOTA
Sioux Road, Inc.—Rapid City, Sioux Falls
TENNESSEE
Carey Equipment Company—Memphis
TEXAS
Moore-Harris Machinery Company—Abilene
Tom W. Carpenter Equipment Co.—Amarillo
G. A. Coffey Company, Inc.—Dallas
Pearce Equip., Co., Inc.—Houston, San Antonio
VIRGINIA
Cary Hall Machinery Company—Salem
Industrial Service Company, Inc.—Norfolk
Knight Equipment, Inc.—Richmond, Arlington
WASHINGTON
Star Machinery Company—Seattle, Spokane
WEST VIRGINIA
Equipment Distributors, Inc.—Charleston
WISCONSIN
Hunter Tractor & Machinery Co.—Milwaukee, Green Bay
WYOMING
Keremi Tractor & Equip. Co.—Cheyenne, Casper
CANADA
Precision Machine & Foundry—Calgary, Alberta
West Coast Equipment, Ltd.—Vancouver, B. C.

Blue Brute distributors announce

NEW GUARANTEED AVAILABILITY PLAN

an air tool on free loan if your Blue Brute needs repair

The most important thing about an air tool is to keep it out on the job working. That's why Worthington Blue Brute tools are built for ruggedness—for ability to stand up under day-in, day-out punishment.

Another progressive step in keeping Blue Brute air tools on the job has just been announced. Under the terms of a new Availability Plan, we will lend you an air tool free if any of your hand-held Blue Brute tools is in our shop for repair.

To be sure the tool you need is there when you need it, we have recently enlarged our stock of standard air tools and accessories. We also carry a large inventory of parts so that repairs or replacements can be made quickly and inexpensively on all Worthington Blue Brute tools.

For greater profits keep your air tools on the job by (1) buying Blue Brute tools and (2) taking advantage of the Guaranteed Availability Plan. For complete details on the new plan, ask your nearby Blue Brute distributor for Bulletin G-2500. H-75A

WORTHINGTON

◀ *See your nearest Blue Brute distributor.*

HOW A 5-MINUTE WARM-UP S

"Slashes our maintenance" says Pasquale Bros., Inc. about the clutch on the Blue Brute Rotary

How can a warm-up save money on compressor maintenance?

The secret is inside the compressor. Unlike most rotaries, a Blue Brute has a clutch which lets you warm up the engine *without engaging the compressor.*

While the engine is idling, warm water from the engine water jacket circulates through heating coils in the compressor oil reservoir. By easing the strain on the engine and pre-heating the compressor oil, the Blue Brute's clutch gives you easier starts, less wear and tear. Result: years of extra life for both engine and compressor.

Here's what Anthony Pasquale of Pasquale Bros., Inc., leading New Jersey blasting contractor has to say about the Blue Brute clutch. "We use plenty of compressed air equipment in our operations and the clutch feature makes a lot of sense to us. In cold weather we would no more start up a Blue Brute Rotary without a warm-up than we would

P SAVES HUNDREDS OF DOLLARS

one of our crawlers or big trucks. Based on our experience so far I'd say that this feature alone will save us several hundred dollars on each of our Blue Brute rotaries.

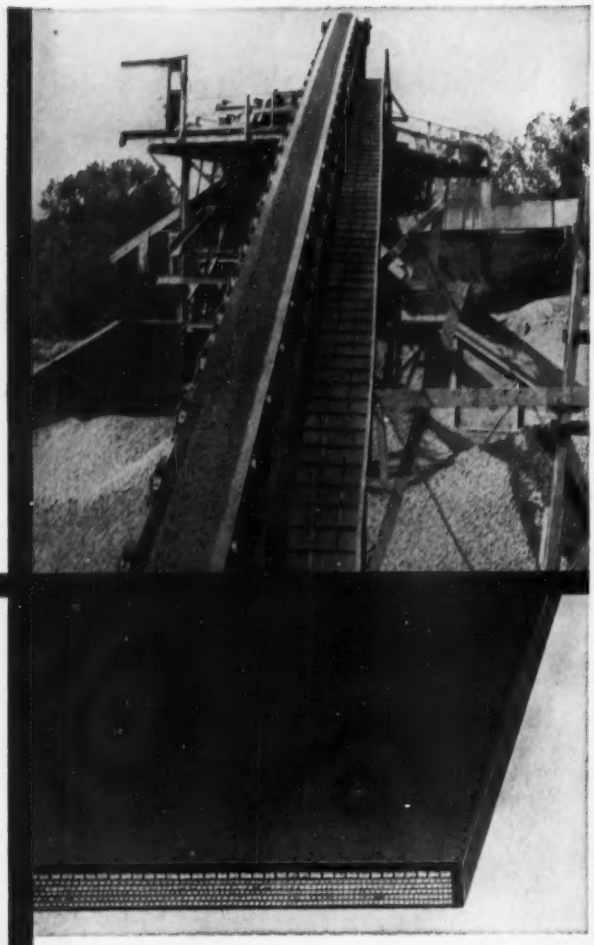
"The clutch," continues Mr. Pasquale, "simplifies our engine maintenance and tuning. It also provides a flexible connection between engine and compressor."

Your nearby Blue Brute distributor will be glad to demonstrate the "rotary with a clutch." He'll also show you other eye-opening compressor features: the Lifetime filter that saves $180 every time you would normally need a change, the unique self-draining cylinders, and the Blue Brute's amazing accessibility.

Blue Brute rotaries are available in 125′, 210′, 315′ and 600′ sizes. For descriptive bulletins on each unit, write to Section H-74, Worthington Corporation, Harrison, N. J. In Canada: Worthington (Canada) 1955, Ltd., Toronto, Ont.

WORTHINGTON

If you convey this . . .



you need this . . .

QUAKER CONVEYOR BELTING FOR TOUGH SHOCK RESISTANCE!

The Quaker belt you see above is made especially to take the impact and abrasive wear of sharp, jagged loads.

Carcass is formed of multiple plies of strong, high-quality cotton duck, with skim coat between plies. Average cover tensile strength is 2500 to 3000 lbs.

Do you need even greater troughability, flexibility or tension rating? Quaker can supply belts of new high tensile strength rayon or cotton-nylon fabrics. Any desired cover thickness.

Your Quaker Rubber-Quaker Pioneer Rubber distributor also carries a complete line of hose, packing and moulded rubber products for every use. Call him today.

For free brochure, please write to:
H. K. Porter Company, Inc., Quaker Rubber Division, Philadelphia 24, Pennsylvania, or Quaker Pioneer Rubber Division, Pittsburg, California.

HKP QUAKER RUBBER DIVISION
QUAKER PIONEER RUBBER DIVISION
H. K. PORTER COMPANY, INC.

JOB TALK . . .
continued

drilling, the operator pushes a switch which starts all the drills. By means of an air cylinder on each drill, the operator feeds the drills through the timber when he turns a two-way air valve. Drills are withdrawn when he turns the air valve in the opposite direction.

Most holes are counterbored so that the ⅝ and ¾-in. bolts used in the fastening operation are flush with the timber surface.

The multiple-drill setup has been used steadily eight hours per day, and more than three railroad car loads of timber have been processed through the drilling line.

Tractor Serves as Hoist

On a New York City wrecking job, Lipsett, Inc., demolition contractor, converted a Ford tractor into a rolling hoist for lifting tools and materials to the top floor of a building being razed. Cable runs from a pulley attached to outrigger on building's roof. Cable then runs down through pulley (left) and is attached to front end of the tractor. Tractor simply backs up to lift load to top.

Stop Tractor "Rustlers"

In order to stop any would-be "rustlers" who might be tempted to play "cowboy" with its units, Newton Creek Development, a Brooklyn, N.Y., firm, came up with this instrument panel cover to prevent anyone from starting the tractor. The cover is designed to slip on and lock in place over the instrument panel. To remove the

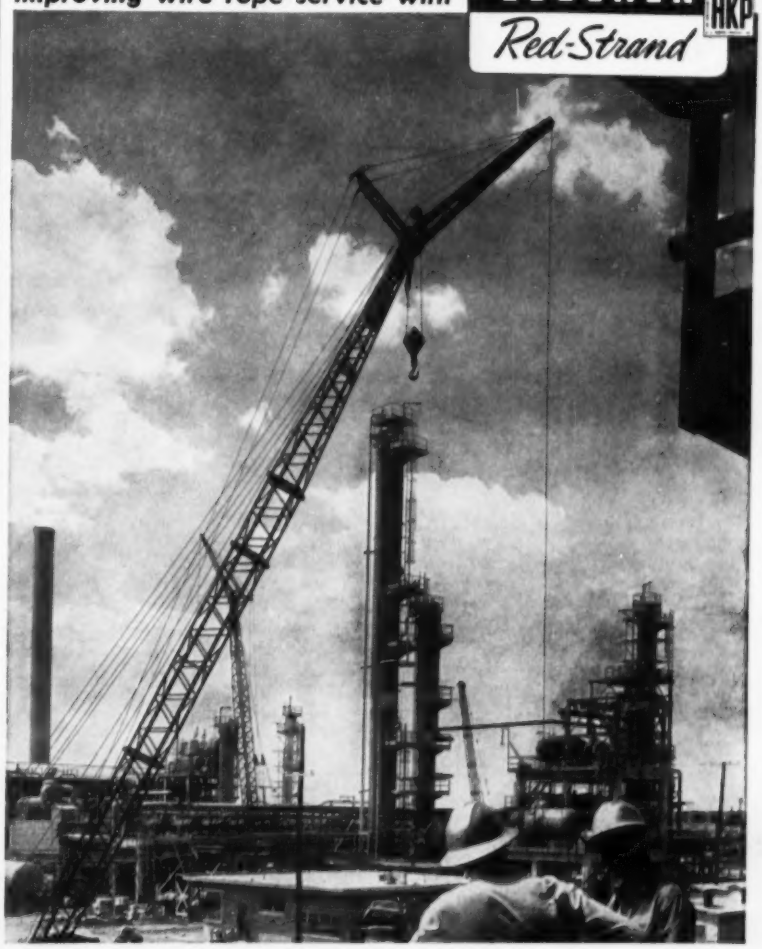
continued on next page

device, the operator needs only to unlock and lift. He then fastens the cover to the left side on the fuel tank by a tension-type catch.

How to Insulate Pipes

Insulating one of the world's largest high temperature hot water systems at New York International Airport is Gilsulate, a natural hydrocarbon insulation. Pipes for the heating system lie on a bed of concrete in the trench. Bags of Gilsulate are slid down into the trench, opened, and poured around the pipes. Once pipes are covered, the insulation is firmly tamped. When steam is turned on the insulation around the pipes forms a tough, semi-plastic waterproof material.

Improving wire rope service with LESCHEN HKP *Red-Strand*



This *one* test proves which wire rope serves you best

"Problem jobs" may frequently make you wonder about the rope you're using.

Are you faced with unusual operating conditions? Is the rope the right type—size—grade—construction? Is greater tensile strength needed? Are you using the right brand?

The test is to use Leschen's on-the-job Service-Score Sticker reports. Keep the score—know the results—and questions are answered.

Then check with your Leschen man for engineering help. And, be sure to use Leschen's highest quality, service-proved Red-Strand wire rope. *Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.*

Write for Service-Score Fact-Folder

HKP LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.

On the Cal-Sag channel widening project

Mary Construction

Adamec and Garms watch Lima dragline in action. Helping customers with the lubrication of equipment such as this is something for which Steve Adamec is well fitted. Steve has a mechanical engineering degree from Purdue. He has been providing technical service to Standard customers for 10 years. Steve is a graduate of the Standard Oil Company Sales Engineering School.

Project Superintendent Bill Jordan and Ray Elgas lay out schedule for servicing Page dragline. Page has 9.5 yard bucket, is powered by Page ½ vertical V6,700 h.p. diesel.

gets the job done

...uses STANDARD Fuels and Lubricating Oils

In 565 days, Mary Construction will widen 3.5 miles of the Cal-Sag ship channel. The channel will be widened to 225 feet from its present 60 foot width. To do this, Mary Construction will move 2.8 million yards of dirt and rock. Big job. Big need for service on gasoline, diesel fuel, lubrication oils. Mary Construction buys from the Standard Oil Company.

This is why Irvin Garms, general superintendent, and Bill Jordan, project superintendent, decided on Standard Oil products. First, they knew they would get products of top quality . . . products that meet or surpass the equipment manufacturer's recommendations. Just as important, they knew they would get service. Standard's bulk plant is only four miles from the project. Deliveries are made twice daily. In the early stages of the project, additional deliveries were made at midnight and at 8:00 a.m. Additional emergency trips were frequent at first, but with the delivery point only four miles distant, there was no strain.

With this service came another important Standard Oil plus—Standard Technical Service. Men experienced in rendering such service to contractors were assigned to the project from Standard's Joliet Division office only a few miles away. Ray Elgas and Steve Adamec, lube specialist and Chief Automotive Engineer respectively, spend hours at the site helping make sure equipment is never down for lack of lubrication or service.

Want this kind of service on your job? You can get it anywhere in the 15 Midwest or Rocky Mountain states. Call your nearest Standard Oil office. Or write, Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

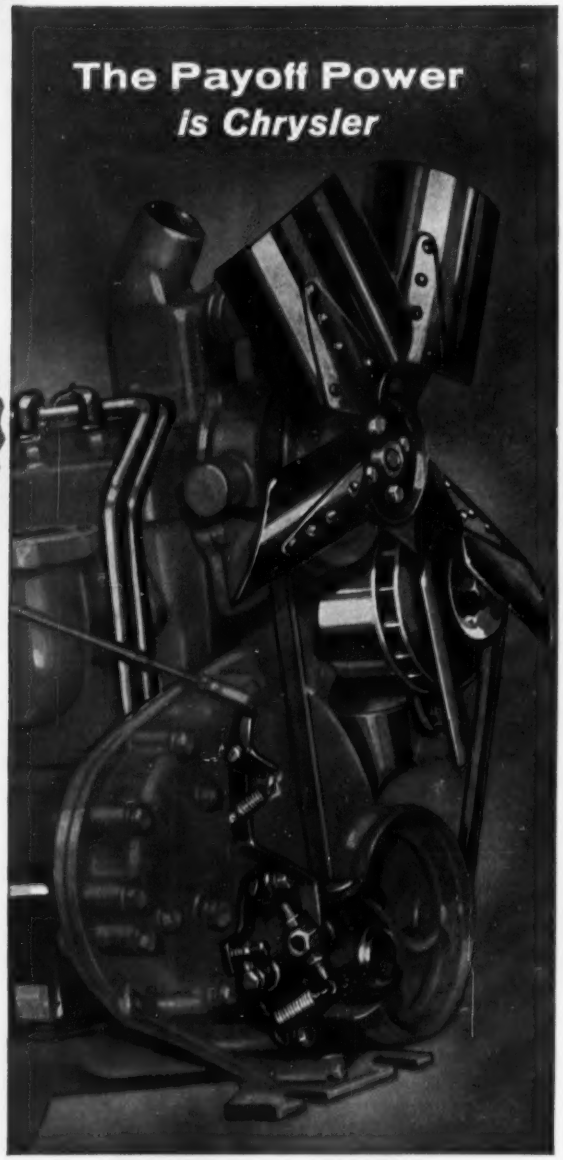
Steve Adamec, Standard Oil Chief Automotive Engineer, and Irvin Garms, General Superintendent for Mary Construction, discuss lubrication of Lima dragline. Lima unit, one of two draglines on the job, is powered by Caterpillar D-397 engine.

Ray Elgas (right) gets some facts about Cat operation from operator Scotty Cummings. For more than 12 years, Ray has been helping automotive customers with lubrication technical service. He qualified for this work after completing the Standard Oil Sales Engineering School. Ray also attended the University of Nebraska.

STANDARD

STANDARD OIL COMPANY
(Indiana)

still going strong...



Eight years of tough, continuous operation—with minimum care and maintenance—yet this Chrysler-powered Pettibone Mulliken Speedloader has never failed to meet a work day schedule.

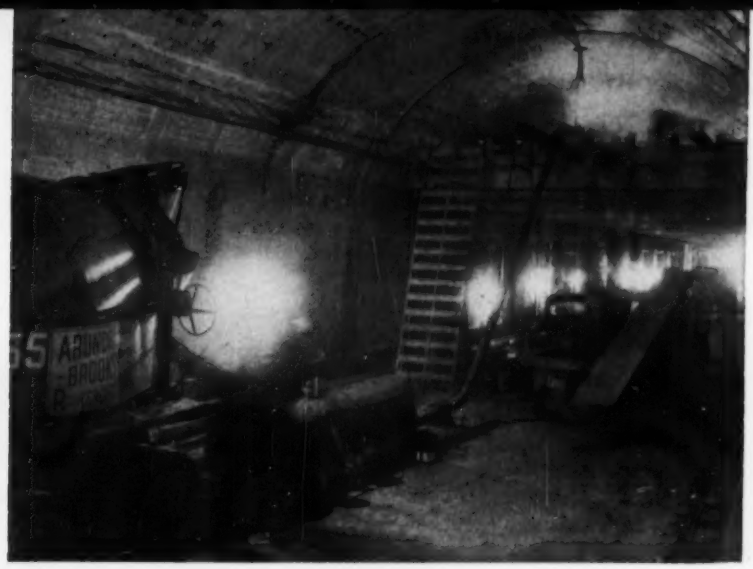
"We use it mostly for loading pea gravel," says J. L. Pharr, Supervisor Shop #3, Dallas (Texas) County Road Commission, "but at one time or another it's been used for almost everything—even hauling 48" concrete pipe. It hasn't been treated with any respect, either. Everybody but the bookkeeper has operated it . . . and any machine used like that has a right to break down *but this one hasn't!* In fact, on any of the equipment we operate we've never had a Chrysler Engine fail!"

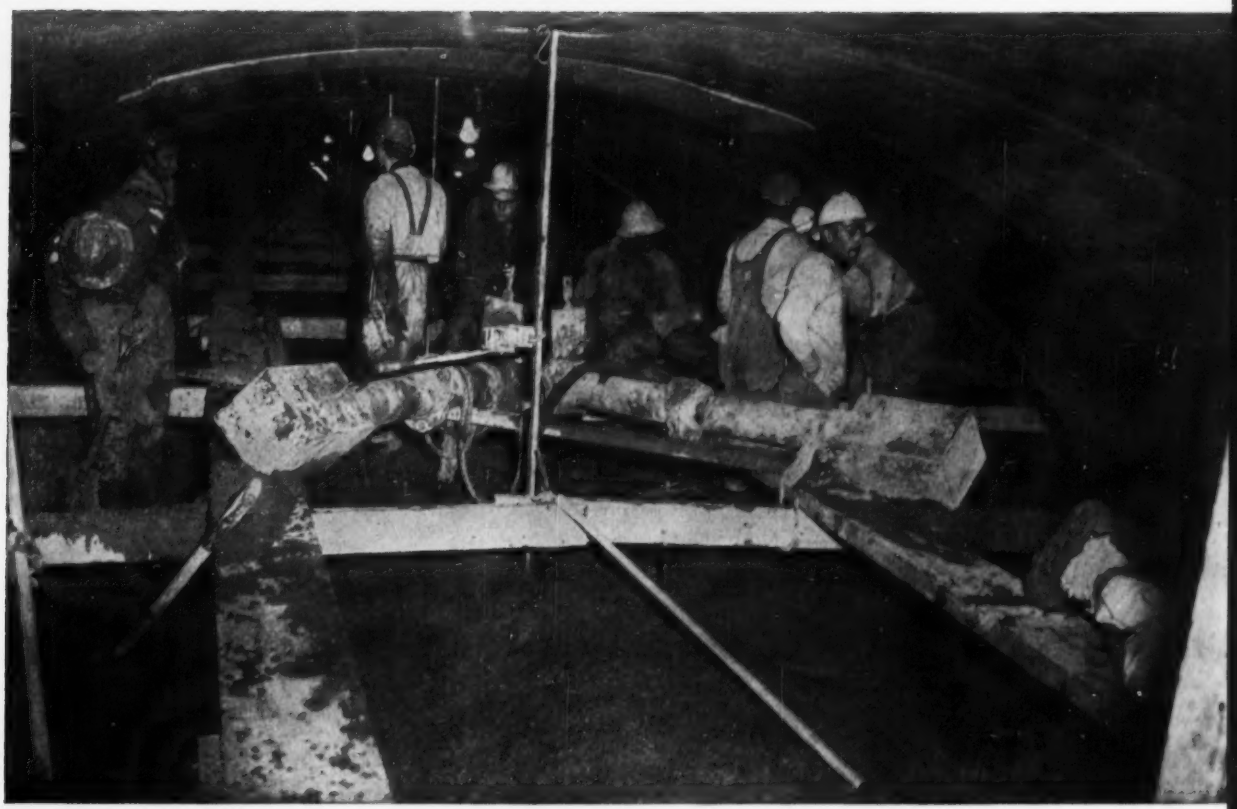
CHRYSLER INDUSTRIAL 33, in-line 6 (265 cu. in. displacement) Engine powers many makes of equipment in the construction and materials handling fields. There are five Chrysler in-line 6s, two V-8s—ranging from 230 to 354 cu. inch displacement. For detailed information about Chrysler Industrial Power, write: Dept. F4, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.

Chrysler
INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

PICTURE OF THE MONTH





From Truck to Ceiling Form

• A neat air placement rig takes concrete from mixer trucks and places it in ceiling forms of the 6,860-ft tunnel under Hampton Roads, Va. Merritt-Chapman & Scott Corp., holder of the $19 million contract for the tunnel and approach bridges at either end, chutes concrete directly from mixer trucks into a Worthington pneumatic concrete placer. A 6-in. pipe carries the mix up to the ceiling forms where it is discharged from two pipes fitted with job-made, steel plate deflectors that distribute it evenly over the entire width.

Yes, it's true! Contractors

Saves handling and moving time

Equipment-Superintendent Herb Wagner of the James McHugh Construction Co., Chicago, says this about the SKIL Motor-Generator Radial Saw: "One of the handiest tools on the grounds. It's power-plus on wheels. Can be moved at a moment's notice to any spot. It has plenty of guts for all of our cutting needs. It's the perfect saw for large construction—adaptable and versatile—a must for construction areas where power is always a problem."

Made only by SKIL Corporation, Chicago 80, Illinois. Factory branches in all leading cities.

Each SKIL Saw pays for itself

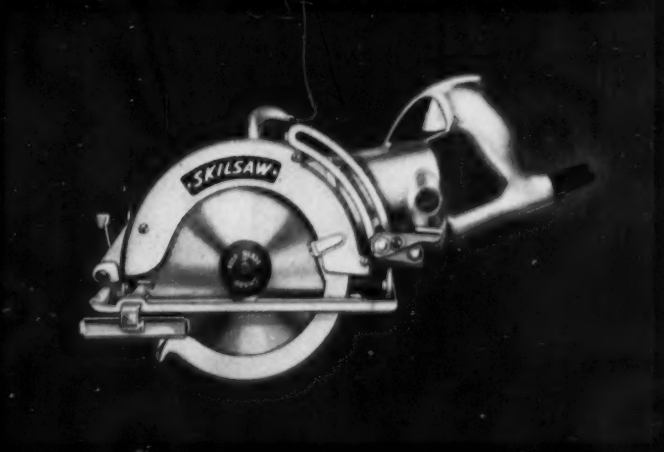
Noel Shafer of Frank Messer & Sons, Inc., Cincinnati, says this about his power saws: "I have tried them all, but a SKIL Saw is lighter, better balanced and has plenty of power. We use them 8 hours a day, 6 days a week through rough material filled with concrete, nails and dirt. Each SKIL Saw we get pays for itself within a couple of weeks of continuous hard use. *It's the best saw on the market.*"

Saves taxpayers money

"Our SKIL Saw has more than paid for itself after only three months of use," says Mr. Ed Garland, Supt. of Maintenance of the Huey Long Bridge Sub-Dept., New Orleans. "By using the SKIL Saw we eliminated the cost of material handling and any farming out for cutting. We use it wherever it is needed. It does everything that we have asked and then some. It has saved our department time and headaches—and the taxpayers money."

Top and effort

"To push from a rear handle saw on heavy construction work is much easier than top-handle saws," says Mr. Joe Browning, superintendent of the H. D. Tousley Co. Inc. of Indianapolis. "We have at times tried several makes, but none compare with SKIL Saws. They are the easiest to handle. I have seven saws on this project and they are all SKIL. They give us top-notch performance."



YOU, TOO, CAN SAVE

SKIL 7¼" Model 77 Saw above saves on every heavy construction job. Saves time, money, maintenance. The standard in general construction for all-around use. No matter what you have to cut, plane, sand or rout, there's a SKIL tool that can do the job faster, better, cheaper. Let your SKIL distributor show you why. Or use the coupon for more information.

always SAVE with SKIL Tools

Send for FREE *booklet on power tools.*

SKIL PORTABLE TOOLS

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5033 Elston Avenue
Chicago 30, Illinois

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_____ Please send me FREE booklet on SKIL power tools

_____ Please send me name of nearest distributor

Name _____ Title _____

Company _____

Street _____

City _____ Zone ____ State _____

CONFIDENCE FIRST!

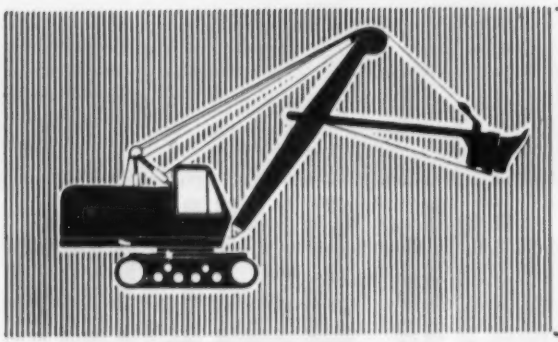
For more than a century it is our established policy to make customer's confidence our primary concern, and this confidence won DEMAG their worldwide reputation.

Thorough research, regardless of cost, was the foundation of the extensive DEMAG development program. And remember: Only a big enterprise is able to apply these principles in turning out their products.

For more than 5 years a staff of DEMAG engineers have devoted their special effort to the application of air control. The new DEMAG series-400 Shovel-line is the result of a carefully planned, painstaking engineering work. It was not until exhaustive field tests were passed successfully that the green light was given for series production of the new DEMAG line of air-controlled Shovels:

- ¾ cu. yd. Model B 406, crawler-mounted;
- ¾ cu. yd. Model B 406, wheel-mounted; takes motive power from deck engine and makes up to 13 mph on the road,
- ¾ cu. yd. Model B 406, Truck Shovel with a separate carrier engine, makes up to 38 mph on the road;
- 1 cu. yd. Model B 408, crawler-mounted;
- 2½ cu. yd. Model B 418, crawler-mounted;

The development of further air-controlled models is going on systematically. DEMAG is the first German shovel maker to hit the market with machinery designed and built for easier, faster, and more dependable operation. A world-wide service organization, backed by experienced consulting engineers, guarantee economical and trouble-free operation of all DEMAG equipment.



Write for Literature and complete details today!

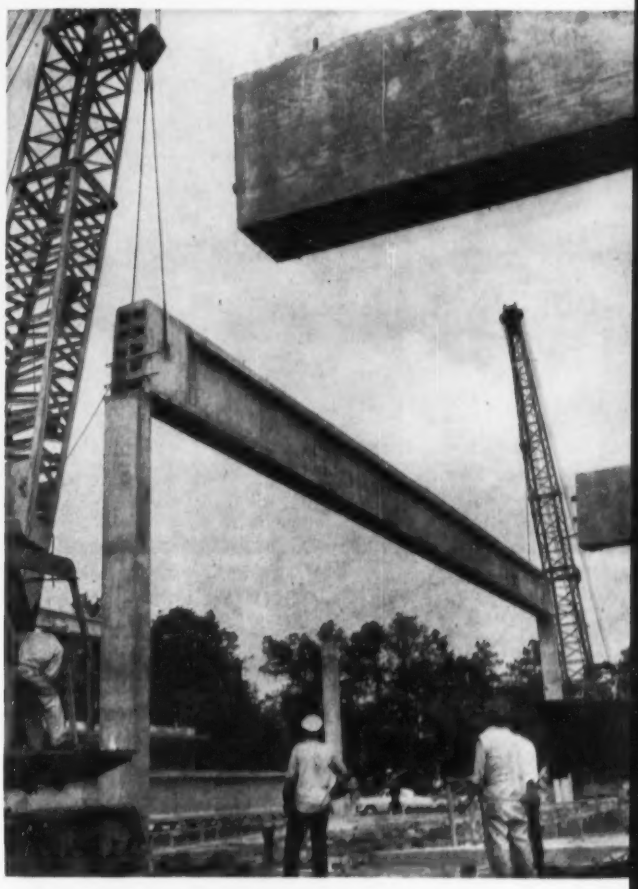
DEMAG BAGGERFABRIK GMBH

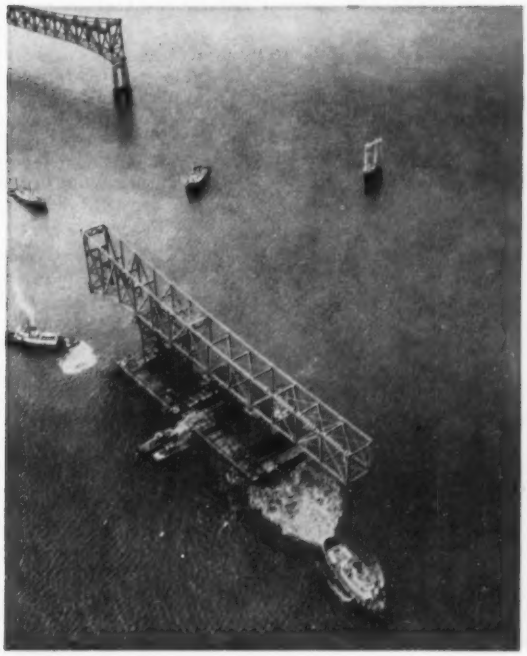
DÜSSELDORF-BENRATH Fernruf: Düsseldorf 71421 · Fernschreiber: 08582703 Telegr.-Adr.: TW 703 = Demagbagger Düsseldorf

Construction News in Pictures . . .

For Rugged Service

High tensile bolts help guard against vibration failure in the frame of P. H. Glatfelter Co. paper mill in Spring Grove, Pa. The building will house heavy papermaking machinery and cranes whose operations will impose stresses on connections. Belmont Iron Works, makes connections with Russell, Burdsall & Ward bolts.





Prestressed at Site

Cranes set prestressed concrete girder in place to span 92 ft wide auditorium of Frank M. Black Junior High School in Houston, Tex. Girder is 24 in. wide and 5 ft 4 in. deep, tapering off to 5 ft at the ends. Farnsworth and Chambers, the general contractor, precast and prestressed all members at the job site using Prescon Corp. prestressing tendons.

Taking Shape

The last of 14 prefabricated truss spans moves into place for the $16 million Rappahannock River Bridge in Virginia. The span is 468 ft long and weighs 900 tons. Completion of the cantilever center span is scheduled for this month. Bethlehem Steel Co. fabricated 12,855 tons of steelwork for the superstructure of the bridge at its Pottstown, Pa., plant.

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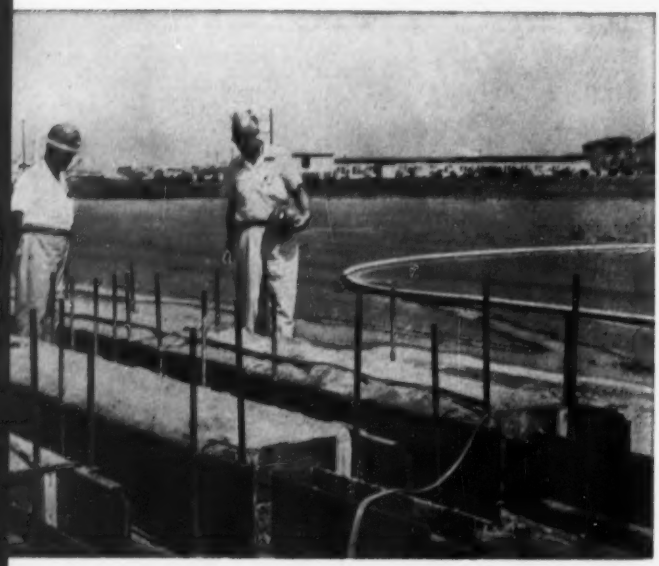
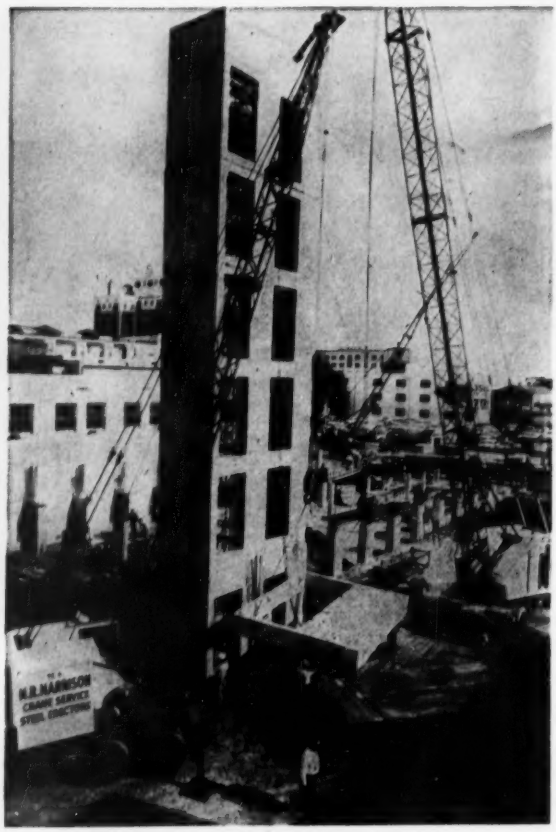
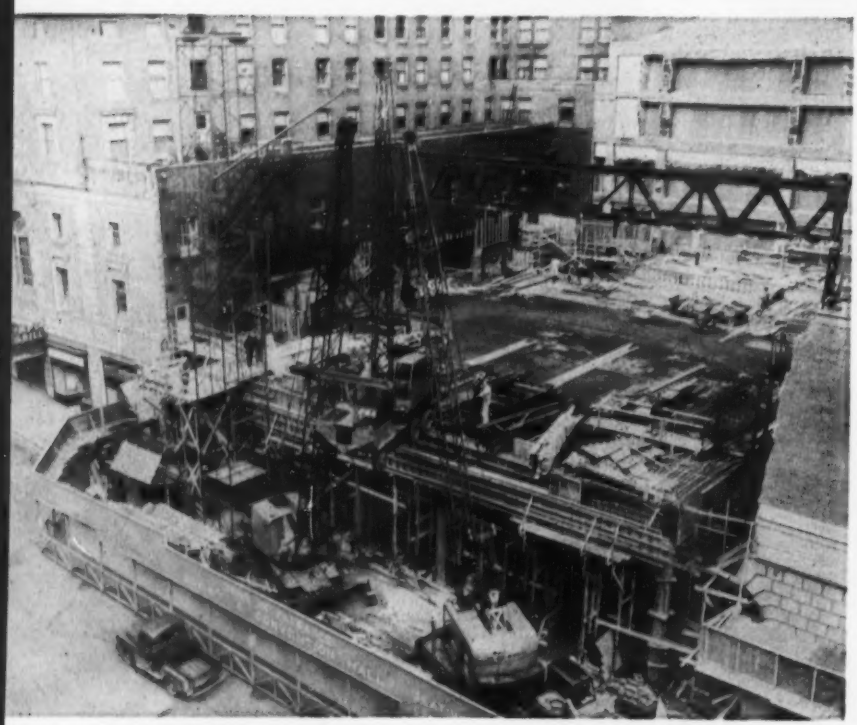


Casting Piles

Steel street forms ordinarily used in curb, gutter, and sidewalk construction serve as forms for concrete piles to support a quay wall at the Charleston Naval Station. Manu-Mine Research and Development Co., the contractor, is pouring 10 to 12 piles a day with the Blaw-Knox forms. A total of 500 piles 63 to 77 ft long will go into the quay wall.





To Save Time

Elevator hoistway for the Watts Parking Garage in Miami, Fla., is erected as soon as the building foundations are in so that the Otis elevators can be installed and ready to operate by the time the building is completed. M. R. Harrison Construction Co. cast 8-in. reinforced concrete panels on the ground and erected the hoistway in only four working days.

Cranes Lift Crane

Two Lorain Moto-Cranes hoist a third Lorain to a special runway on the second floor of a building under construction to set steel and handle materials for additional stories. Job is construction of the 1,500-seat Olympic Plaza exhibit and convention hall addition to the Olympic Hotel in Seattle, Wash. MacRae Bros. of Seattle is the contractor.

MAX-WEAR ALLOY

makes parts like these last longer

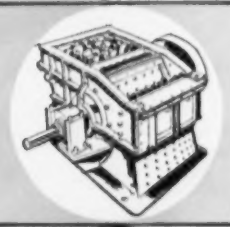
DREDGE BUCKET

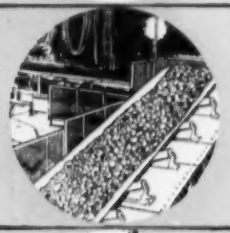
ROCK CRUSHER

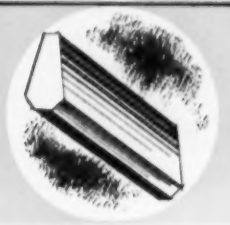
CHUTE LINING

WEAR PLATE

GROUSER BARS







—keeps equipment on the job

Max-Wear Alloy Steel (13% manganese, 2% nickel) is *work hardening!* This means the more it's used the harder the surface becomes (up to 500/550 BHN). But only the surface hardens; the interior of the steel is unaffected. As a result, Max-Wear parts have truly wear-resistant surfaces *plus* high strength and toughness internally.

When you make parts like those shown with Crucible Max-Wear, you reduce downtime, cut repair and replacement costs. For Max-Wear resists repeated heavy impacts and abrasion—just what you need on jobs where equipment takes a bad beating.

Crucible Max-Wear is especially practical for repairs in the field. It can be formed cold or at *red heat*, and is easily shear or torch cut and welded. No annealing is necessary after these operations—a big advantage in the field.

Max-Wear is now available in rounds, squares, plates and special grouser shapes. If you are looking for an easy-to-use alloy steel that will give you longer service under impact, wear and abrasion, try Crucible Max-Wear. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

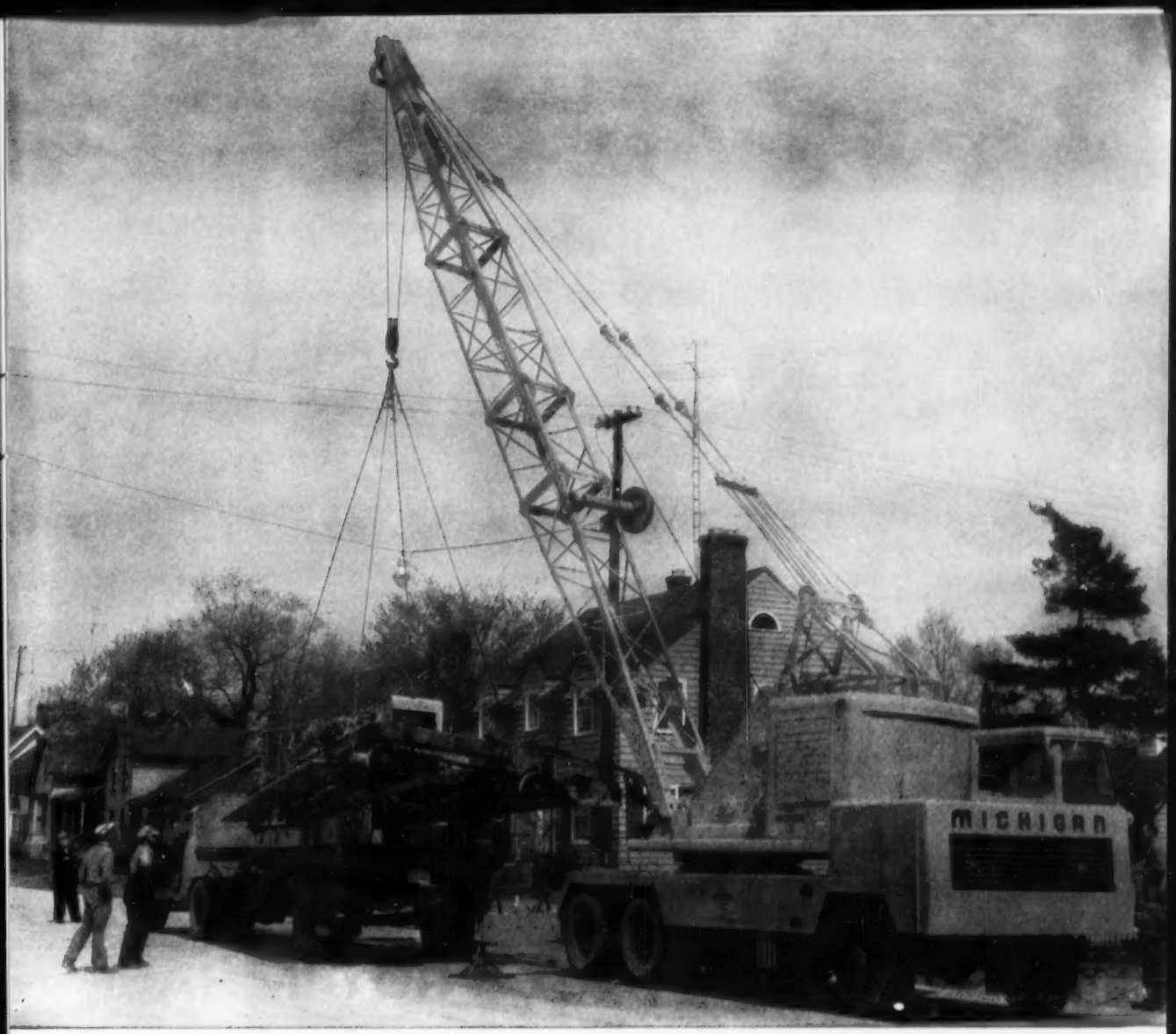
Crucible Steel Company of America

SAVES ENGINES!

Use Sinclair SUPER TENOL® to save your Diesels from the harmful and costly effects of *severe* operating conditions. Sinclair SUPER TENOL is specially engineered for the tougher jobs! It saves engines by combating the effects of high temperature, over-loading, and continuous stop-and-go service. It helps eliminate deposits of varnish, carbon and sludge that impair engine efficiency. Experience shows that Sinclair SUPER TENOL keeps equipment on the job longer . . . with less wear and fewer repairs!

Refill now with Sinclair SUPER TENOL. Contact your local Sinclair Representative or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N.Y. *There's no obligation.*

SINCLAIR SUPER TENOL MOTOR OIL



Need to move heavy equipment in a hurry? Here's the way . . .

Expressway Contractor Relies on New Michigan

With around 85 men on their 1½-mile four-lane North Glade Expressway paving job every day . . . with 40 batch trucks and dozens of pieces of specialized road-building machinery to keep busy . . . Carl Goodwin & Sons, Allegan, Michigan, has a major coordinating task . . . and that's where their new Michigan 25-ton excavator crane comes in!

Moves cement finishing machines

Putting in pavement at intersecting streets is an important—but costly—part of the 70,000 square yard contract. To save money, cement finishing machines must be moved with as little lost time as possible! One man in the Michigan picks up these bulky rigs, moves them quickly to the next section site. No need to load heavy equipment on a trailer for these short hauls—the Michigan can transport it alone!

Michigan lifts and carries 14-ton sub-graders

To make best use of heavy sub-graders, they too must be moved—fast! Operator Dale Anson says: "The Michigan has plenty of lifting power—well beyond the weight of anything we've yet had to move. Besides the sub-graders—which weigh about 14 tons—I also lift and carry bull floats, spreaders and finishing machines. I particularly like Michigan's worm-gear boom hoist, with power up *and* down. It lets me ease loads in very precisely."

Goes everywhere without permit

"The new Michigan has done a good job!" reports Supt. Cal Harris. "Our operator says it's easier to handle than any other crane. It does a fine job pulling and resetting forms, and breaking old pavement with a skull-cracker. It goes everywhere . . . over all kinds of roads . . . without special permit!"

Let us show you how Michigan versatility and mobility can pay off for *you!*

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 25, Michigan
In Canada: Canadian Clark, Ltd.,
St. Thomas, Ontario

Michigan is a registered trade-mark of

CLARK® EQUIPMENT

"Material-handling worries ended," reports leading Wisconsin building contractor

TIME, LABOR COSTS CUT IN HALF by versatile Michigan Tractor Shovel

Savings of 40 to 90% in time and 50 to 75% in labor costs resulted when the Selmer Company, Green Bay, Wisconsin, assigned material handling to this Model 75A Michigan Tractor Shovel.

"You might say the Michigan combined the mobility of a pickup truck with the traction of a crawler," explains one Company official. "It certainly eliminated the usual problems of unloading and moving building supplies: the slow expensive hand labor . . . the slowness and lack of mobility of crawler-loaders . . . the lack of capacity of easy-to-get-stuck farm-type tractors."

Saves 3 man-hours unloading blocks

In the two years since its purchase, Selmer has handed dozens of jobs over to the 1¼ yd 80 hp Michigan. Above is a common assignment—moving palletized concrete blocks from trucks to scaffolding. Unit lifts 68 blocks, weighing 3,800 lbs AT ONCE. These are stacked 10 ft high so laborers can skid blocks direct onto scaffolds. Entire job, including stacking, takes two men 10 minutes. Unloading alone used to take five hand-laborers an hour. And an elevator had to be set up and used continually.

Saves $15 to $25 per brick truck

Similar savings are reported when brick is handled. It used to take four men using brick tongs three hours to unload a semi-trailer. Now, Selmer has the bricks palletized in 500-unit lots, 12 pallets to the semi . . . unloading takes the Michigan and two men 10 to 15 minutes. Smaller trucks carry 4 pallets, take 5 minutes to unload with the Michigan compared to 1½ hours with four hand laborers. Savings average $15 to $25 per truck *including* extra charges for palletizing!

Replaces expensive crane to unload marble

Unloading carloads of marble or cast stone always gave Selmer Company a costly headache too. Formerly, they

(Advertisement)

fented a crane. Recently, however, their veteran shop foreman, Norb Tilkens, designed and fabricated a special boom which attaches to the tilt bracket. With this, the Michigan reaches across a truck, lifts two or three slabs of marble from the railroad car, gently lowers each 700 lb load to the truck bed. In a few hours, the car is completely unloaded. Savings on a typical 15-car shipment run $500 or more.

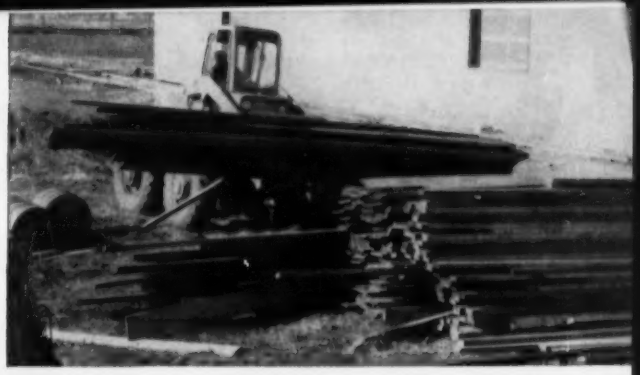
Eliminates ramps, pump set-up for concrete

Above is another home-made attachment . . . a concrete bucket which can be lifted on the Michigan forks. It carries four wheelbarrowfuls per load. Pour is made simply by tilting forks slightly forward so concrete flows out of 6" square spout into forms. Time and labor of barrow-men are saved. Nor does Selmer have to build ramps or, on small pours, set up a pump.

Handles wide variety of other materials

Lots of other materials have been handled from time to time. Some of them are:

Rip-rap —old brickbats and concrete dozed into river to protect building.



Lumber —as much as ¾ of a truck load (3500 to 4000 lbs) unloaded at once, stockpiled, later carried to hoist.

Rolls of reinforcing wire—carried on forks, stockpile to hoist. Fork spacing changed in seconds to fit roll openings.

Trash — cleaned from around building site.

One man changes bucket, forks

Some of these jobs, you'll note, call for fork lift, some for tractor shovel bucket. These two attachments (and others) are easily interchanged. It takes Selmer's operator, John DeMoulin, working alone, 10 minutes.

In two years, NO breakdowns

No matter what the job, Selmer Company can *depend* on their Michigan working a full day! "In two years . . . over 6,000 operating hours," recalls Shop Foreman Tilkens, *"we've NEVER had the machine break down* on the job. It has saved us over 50% in time and manpower!"

A Michigan could do as well for you!

Michigan is a registered trade-mark of

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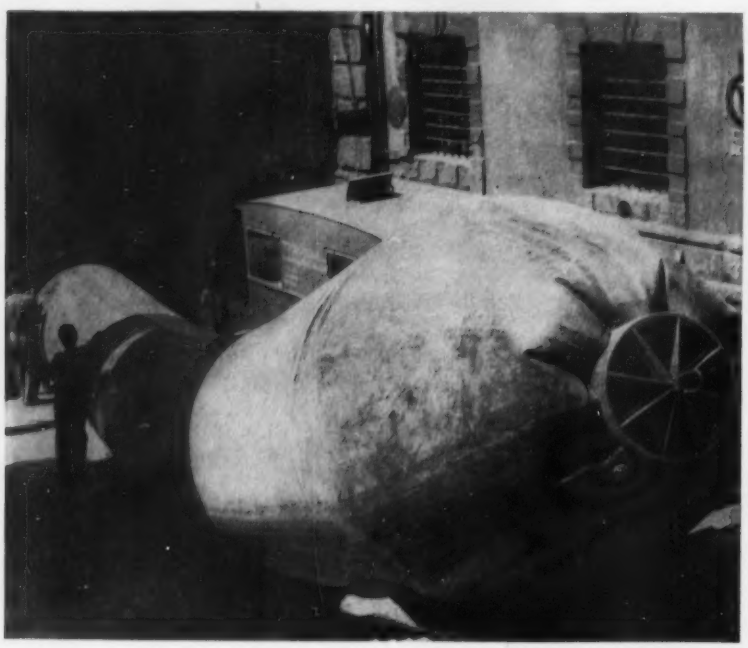
Construction 'Round the World . . .

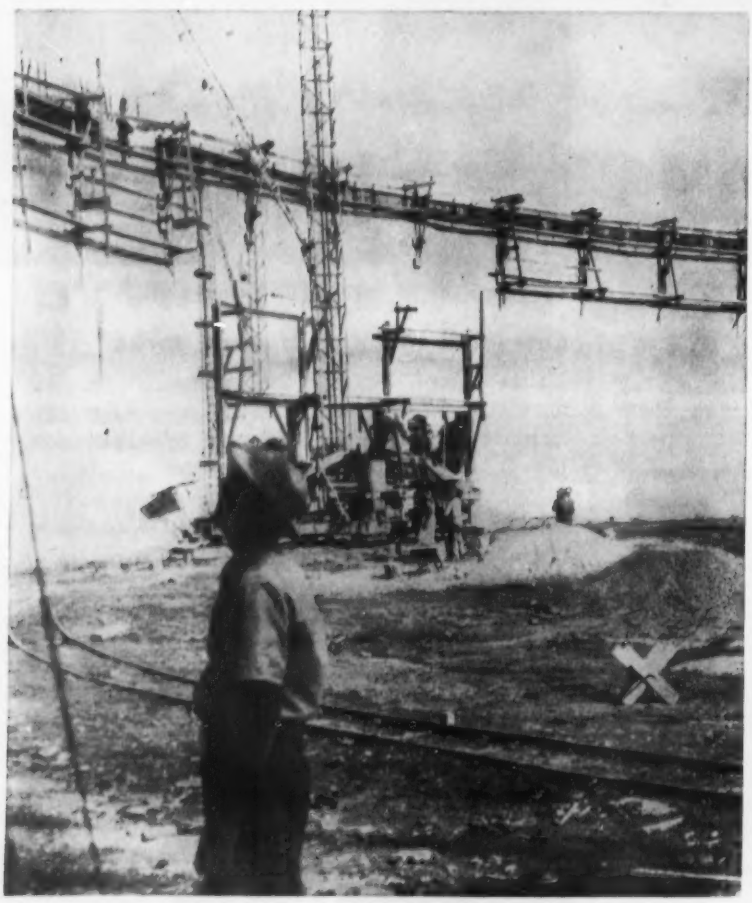


In Italy

Sausage-shaped rubber balloons serve as forms for concrete conduit in Rome and other cities. Produced in various lengths and diameters, balloons are pumped hard with air, placed in trenches, then covered with concrete. When concrete has set, ballons are deflated and pulled from the trench leaving a pipe ready for placing of cables and tubes.

In Australia

Encasing structural steel members in concrete before erecting them cuts labor costs, according to builders "Down Under." Beams and columns are wrapped on ground with an envelope of light steel mesh fastened to the steel with studs. The beam then is placed in a simple wood form, encased in concrete, and erected the same as unencased steel.



In Uruguay

Modified slip-forms raise 85-ft-high concrete walls for new 20,000-seat stadium in Montevideo. Framework scaffolding rises 2 ft 4 in. daily. Support is provided by previously placed wall. Contractor plans a total of 36 lifts to do the job. A rail-mounted derrick raises concrete to form level.

BRAWN...

that stands up to the toughest jobs

Up to 1,000 pounds greater built-in weight gives the new International® 350 Utility *capacity and stamina unsurpassed in the utility tractor field!* Give us an opportunity to *prove* it . . . simply ask for a demonstration. *See* how greater built-in weight gives full-bucket backhoe bites to step up trenching yardage . . . how *full-load traction* speeds up all dozing and loading operations.

Response like you've never known, with *all-tractor* gasoline, diesel, or LP gas engine . . . the power you need for time-saving *capacity!*

Try it! Your IH Dealer will gladly demonstrate . . . just phone him. For free catalog, write International Harvester Company, Dept. CME-4, P. O. Box 7333, Chicago 80, Illinois.

SEE YOUR
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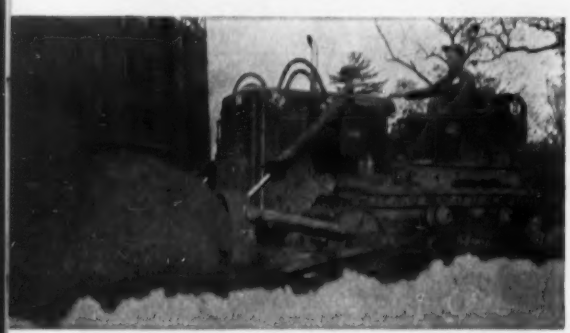
International Harvester products pay for themselves in use—McCormick Farm Equipment, Farmall and International Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois.

On any-size dirt job, anywhere... power-up profitably with

In the 200-acre Knollton Heights Subdivision, Hughy Construction Company, Indianapolis, stays ahead of the lot-grading with this TD-9 Four-In-One. Here, they're getting inch-close grading accuracy—boiling in dirt with Four-In-One "carry-type scraper" action! Excavating, loading, dozing, or clamshell action is instantly available with a Four-In-One!



"Our bread-and-butter machines are International Crawlers," says Perry Alexander, Jr., for Perry Alexander Construction Co., Asheville, N. C. "I just traded in a TD-18A, with 13,000 hours on its meter; used no oil between changes—and beat a competitive crawler in overall maintenance and track life." Picture shows their new TD-14 finish-grading around Asheville's new $600,000 Doctor's Building.

See how the bonus-powered International TD-18, for example, helps speed construction of "decentralized" new factories. You get cleared-for-action deck, control-tower visibility and booster steering to cut lever-pull effort. You also get operating ease of engine clutch with long-lasting Cerametallic facings. Such exclusive *feature combinations* help operators increase daily production, substantially!

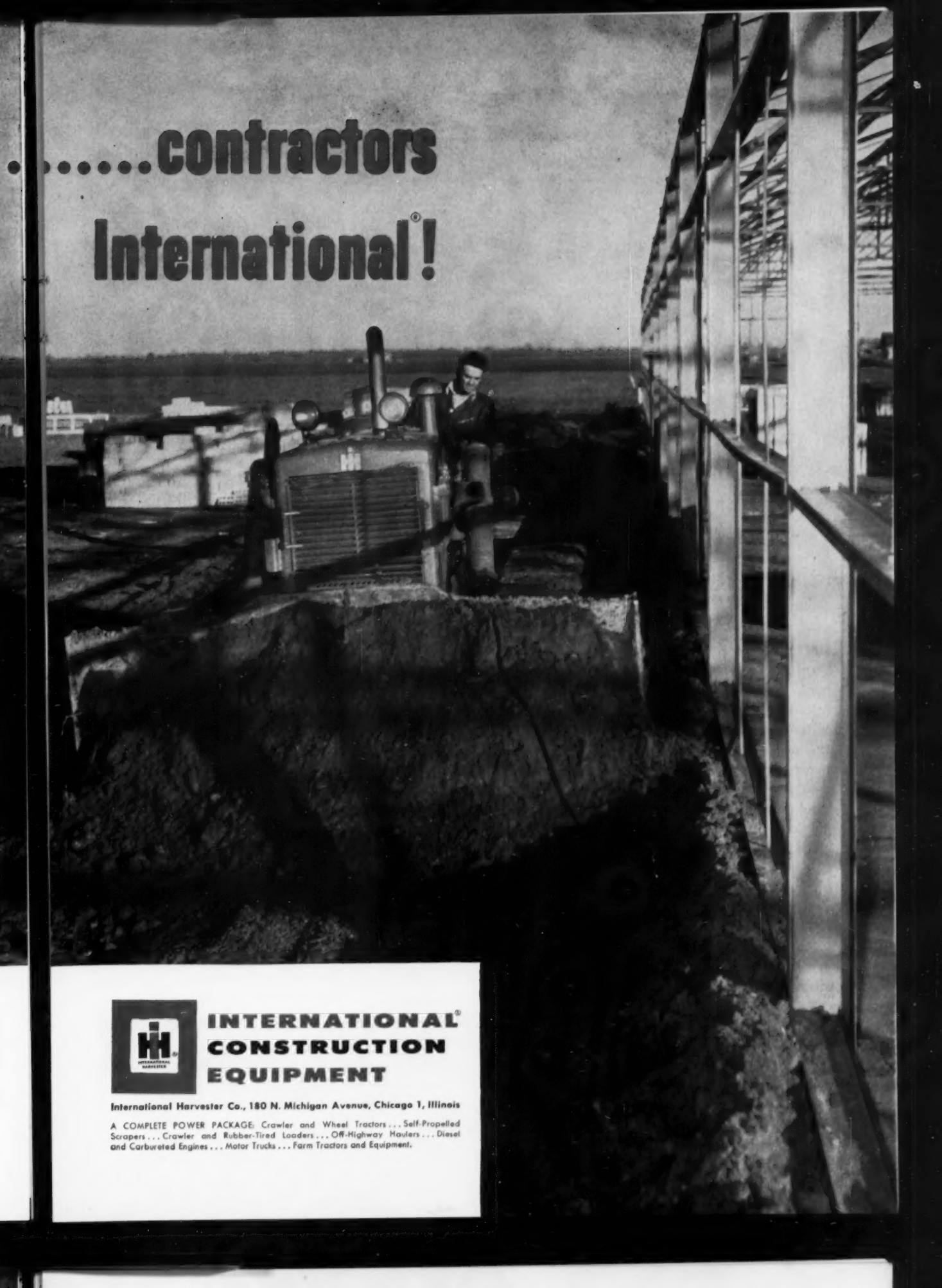
For your king-sized jobs, check these *giant-sized* advantages of the *giant-powered* TD-24. See how exclusive, time-proved Planet Power steering gives you full-time "live" power and traction on both tracks for positive, full-load steering, upgrade or down! Plus cycle-speeding on-the-go shifting—*and* instant, stall-preventing Hi-Lo shifting, without declutching!

For dirt-moving versatility, International Drott® Four-In-One Skid-Shovels® give you huge performance and production advantages over anything else in the loader-excavator field! You get instant, fingertip availability of *four* big-capacity machine actions: famous Skid-Shovel dig-ability; scraper-like grade-or-spread ability; earth-rolling bulldozer; and load-gulping, high-dumping clamshell!

Along with the superhighways are other millions of cubic yards of "big-pay dirt" to be moved in plant, school, public building, shopping center, and housing developments. *Prove to yourself* the reasons why more and more contractors are using International crawlers as their *power packages*. See your International construction equipment distributor for a demonstration.

"One of our TD-24's—a 1951 model—ran 7,500 hours before major overhaul on rails and engine," states P. H. Morris, for Morris Enterprises, Owensboro, Ky. "It's still in use with original rollers and sprockets. That sold me on TD-24's for my operation." This Morris-owned TD-24 moves 50% of the 45-foot earth-shale-soapstone overburden, ahead of the 3½-yard dragline.

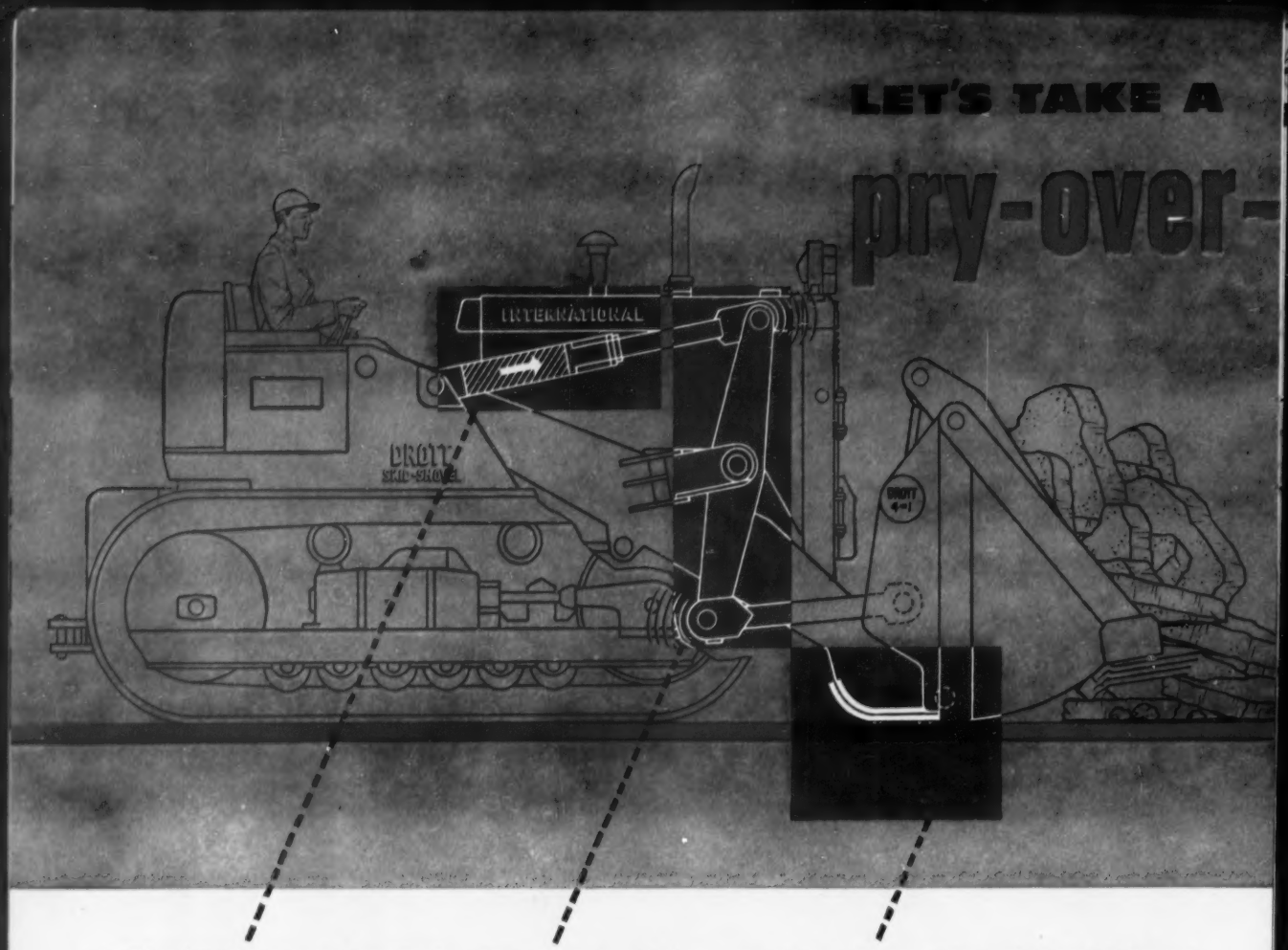
Industry comes to Marked Tree, Arkansas—(population 3,000)—as a modern shirt factory rises on money locally-subscribed to create jobs. And local contractor, St. Francis Valley Construction Co., gets a profitable 8,000-yd fill-spreading job done on time with their hydraulic 'dozer-equipped TD-18!



INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.



Full hydraulic power transfer! Famous International Drott *triple-power* hydraulic force results from ingeniously applying oil pressure upon the piston's *full face*—instead of using the customary, and limited, rod-end area for the "power-push" surface! Only International Drott gives you this tremendous hydraulic power to produce concrete-smashing, tree-grubbing, boulder-bucking pry-action break-out!

Far greater leverage. See how International Drott scientifically-correct *lever length* transfers *full* triple-power hydraulic force to the fulcrum. No costly power-dissipating "step-downs" here to lose one-fourth to one-half your hydraulic power, as ordinary design does! Instead, International Drott full power-applying leverage gives you tough-job-handling digging force and capacity ordinary loaders can't even begin to equal!

Ground-based fixed fulcrum! Here's how exclusive International Drott design provides the famous frame-mounted skid-shoes—to act as the absolutely necessary *fixed fulcrum.* Without this, true pry-action break-out is impossible. The big *exclusive* International Drott skid-shoes provide the steady, ground-based platform for true ground-level bucket-heaping roll-back of 41°!

Prove to yourself you command a vast new job-range and capacity—with this super-powerful excavating, bucket-heaping pry-action. See what happens when you team this performance with the *versatility unlimited* of an exclusive Four-In-One. Compare how *exclusive* shock-swallowing Hydro-Spring "gentles" trouble-causing impact by 67%! Ask your International Drott distributor for a demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL®
DROTT®

CLOSE LOOK AT TRUE

—shoe break-out action

Only original and exclusive International Drott design transfers full hydraulic power to give you tremendous extra excavating force!

Genuine pry-action break-out has three absolute essentials: (1) *full hydraulic power transfer;* (2) *long lever,* to apply pry-power without power loss; (3) *fixed fulcrum,* located to concentrate break-out force for maximum effect.

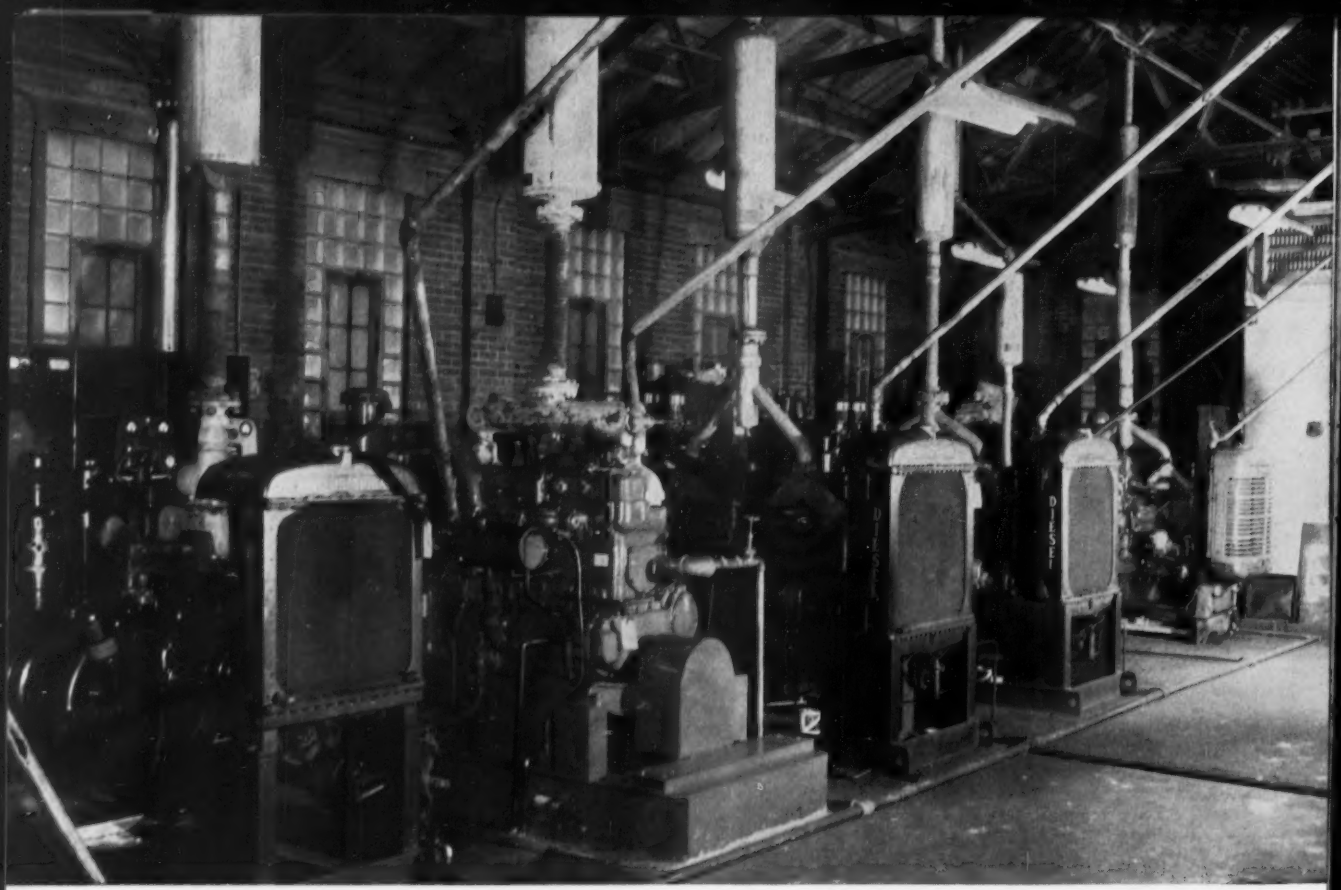
Here's how exclusive International Drott "separates the men from the boys" in heavy-duty loader design—and gives you front-end loader performance and capacity nowhere else available.

Kuschler Construction Co., New Orleans, Louisiana, specializes in demolishing old service stations to be replaced with super-service stations.

Kuschler tore down this old station in one day, then removed the concrete work the second day—doing the entire job with their International Drott TD-9 Four-In-One!

Previously, the contractor demolished the buildings and concrete with compressed air hammers and a three-man crew. Their other make of front-end loader, without true pry-action break-out, was limited to loading debris.

Now, one man, using triple-power International Drott pry-action break-out, accomplishes as much in one day as the three-man crew and four separate items of equipment were able to do in a whole week!



Here are five of eight International diesels that have driven Ready-Power generators in Standard Carbon's powerhouse for a total of 107 engine service-years. The UD-1091, second from left, is seven months old. The other 7 power units average over 15 years each of dependable service.

8 Ready-Power International driven GENERATORS CUT ELECTRIC COSTS 43%

Standard Carbon's International power units going strong after 107 service-years

The Standard Carbon Co., Steubenville, Ohio, is a nationally famous manufacturer of carbon brushes.

President W. F. Rogers fills in these details of their powerhouse operation: "We started in business in 1928 operating on purchased power. Back in 1939 we set up our own powerhouse—starting with an International PD-80 diesel power unit on a 48KW Ready-Power generator. Shortly thereafter we bought two more of these units. Today our eight Ready-Power generators are all driven by Internationals—*and we are generating power for 43% less than we pay for the 15% of the electricity we still purchase.*"

Supt. George Rogers adds: "Good service with only minor repairs sums up our experience with Internationals. Our Internationals have totalled 107 service-years—an average of over 13 years per engine. And only recently I rebuilt one of the 17-year-olds for the first time and still was able to reuse many of the original parts including the crankshaft!"

You, too, can get this same kind of completely dependable, low-cost power for your generator sets...or any driven machine in your pit or quarry. Simply call your easy-to-locate International Power Unit Distributor or Dealer. He can make power recommendations that are right for your needs. Equally important, his service facilities, his parts stock, his desire to be of service will help you get the most out of your engines. Call him soon.

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International Harvester Company
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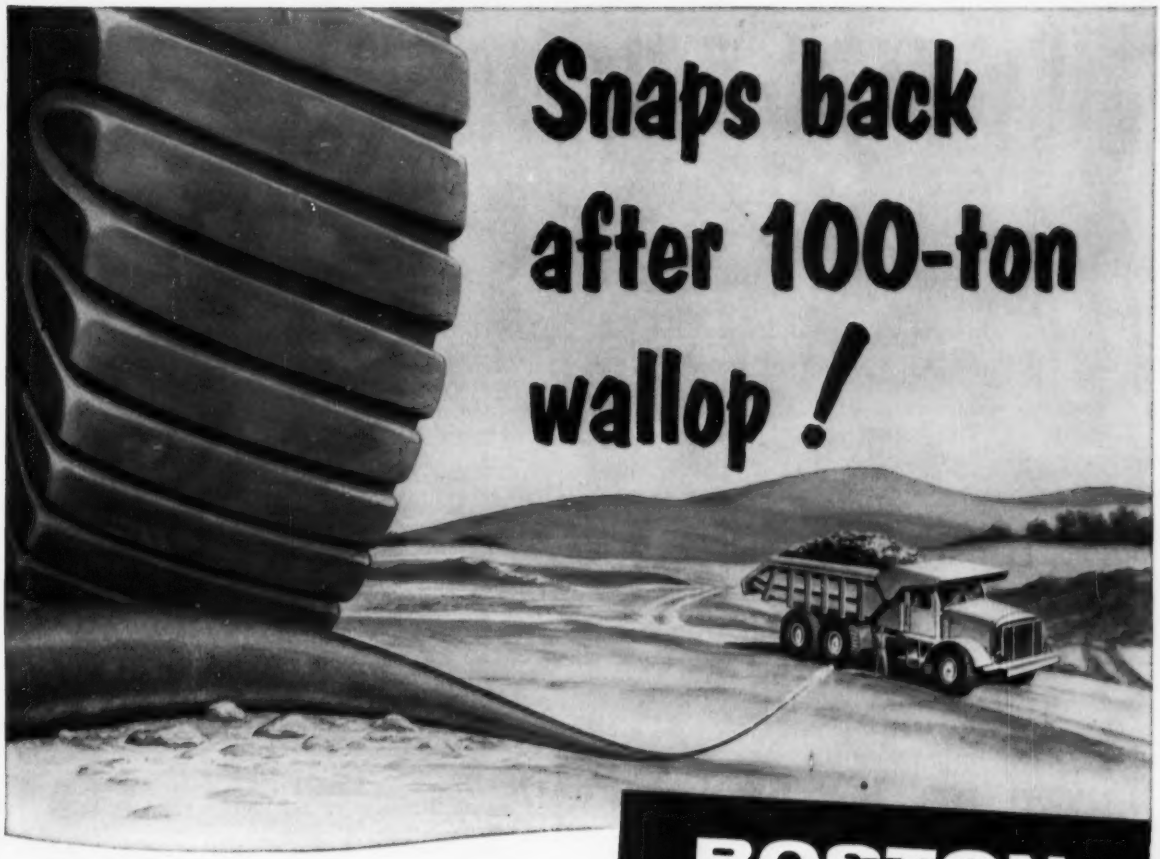
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks



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concord yellow jack
AIR HOSE

This is the hose built to take the most brutal treatment. So strong it snaps back even after being battered by a loaded Model LLD Euclid — a gross weight of 203,300 pounds!

When you consider that 45% of air hose failure is caused by *external* conditions, Boston Concord Yellow Jack is definitely the air hose to choose for your toughest jobs. It has the stamina to handle repeated rugged impact . . . the strength to withstand the highest internal pressures.

Boston Concord Yellow Jack's bright yellow cover makes it easy to identify.

Whatever your hose needs, there's a BOSTON Hose for you . . . and a BOSTON man nearby to help you solve your problems.

BOSTON BOSTON WOVEN HOSE & RUBBER CO.
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If your job calls for PIPE PILES

"Faster-from-Foster" service pays off in big savings!

As uses of pipe for piles increase, more and more contractors are calling on L. B. Foster Company for the best and fastest service available. These contractors know us as specialists in steel pipe for piling, in all diameters and wall thicknesses—spiralweld, electricweld, seamless, and lapweld.

On this river-span job we delivered 16-inch diameter Taylor-Forge Spiralweld foundation pipe (in 52 and 60-ft. lengths) as piling for bents of two bridges which span 135-ft. streams. While we are constantly supplying scores of small jobs every day, we'll also deliver all the material required for even the biggest jobs . . . to your job site, and . . . on schedule. No delays for you, no storage problems, more savings.

Send for Foster catalogs—yours for the asking.

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L. B. FOSTER CO.

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STEEL SHEET PILING · H-BEARING PILE · STEEL PIPE · RAILS · ALUMINUM PIPE · ALUMINUM BRIDGE RAILING

Working from barges, Brennan Brothers of La Crosse, Wisconsin and Lansing, Iowa placed spiralweld foundation pipe in 8 feet of water, then had to drive through 40 ft. of Mississippi River sand, clay and mud bottom. Piling, supplied by L. B. Foster Co. was concrete capped, each measured 26 x 3 x 2 ft.

Construction Methods AND EQUIPMENT

APRIL, 1957

VOLUME 39 • NUMBER 4

HENRY T. PEREZ, Editor

To Protect Your Future

THE CONTRACTING INDUSTRY'S manpower needs are becoming acute. And while much attention has been focused on the shortage of engineers, there is another area that also deserves critical notice. That is skilled workmen.

One authority quotes a present shortage of 147,000 qualified journeymen. He says this already has reduced construction efficiency below par. And he warns that unless the ranks of properly trained men are sharply increased, the construction industry would reach a "point where labor would ultimately determine the number and quality of men they would furnish contractors."

Well, one of the prime remedies for this situation is the apprenticeship program, of course. Yet the Associated General Contractors puts the total number of indentured apprentices at less than 104,000 whereas the minimum number needed is 200,000.

Indeed, in many crafts the number of apprentices is not enough to keep the pool of skilled workmen at today's level, much less increase it. The carpenters, for example, lost 18 out of every 1,000 journeymen in the year 1956 and were able to replace only eight of them with men completing apprenticeship. Other crafts in similar circumstances are the cement masons, plasterers, ironworkers, and painters.

Not all is black, however. The bricklayers lost 19 per 1,000 journeymen but graduated 23 apprentices per 1,000 journeymen. Journeymen roofers scored a net gain of nine per 1,000. And plumbers, electricians, and sheet metal workers equalled or bettered their ratio of journeymen lost to journeymen gained.

But this is not nearly enough. As Secertary of Labor James P. Mitchell told the AGC meeting (p. 95) "It seems to me that when you look at the average age of the building tradesman in this country, and you look at the slow trickle of apprentices who are coming into the industry, that unless both management and labor put more emphasis on joint apprenticeship programs and support them with all that you have got, you may find in this industry very severe shortages of the highly skilled labor you are going to need . . . If it isn't done, the whole industry, eight to ten years from now may suffer drastically."

A constructive step was taken recently along this line. The National Joint Bricklaying Apprenticeship Committee has developed a pre-job training program to give a boy some instruction in his trade before indenture as an apprentice. And the committee has halved its recommended journeyman-apprentice ratio to 5 to 1.

Unfortunately not all crafts are as enlightened, nor do all contractors give apprenticeship programs the support they need. The way some unreconstructed builders talk, you would think that anything that helps labor automatically is bad for management. Well apprenticeship is not a labor versus management operation, it is labor and management. Only through cooperation—immediate, sincere, and continuing cooperation—can we be assured of the increasing numbers of skilled workmen we need for our expanding industry.

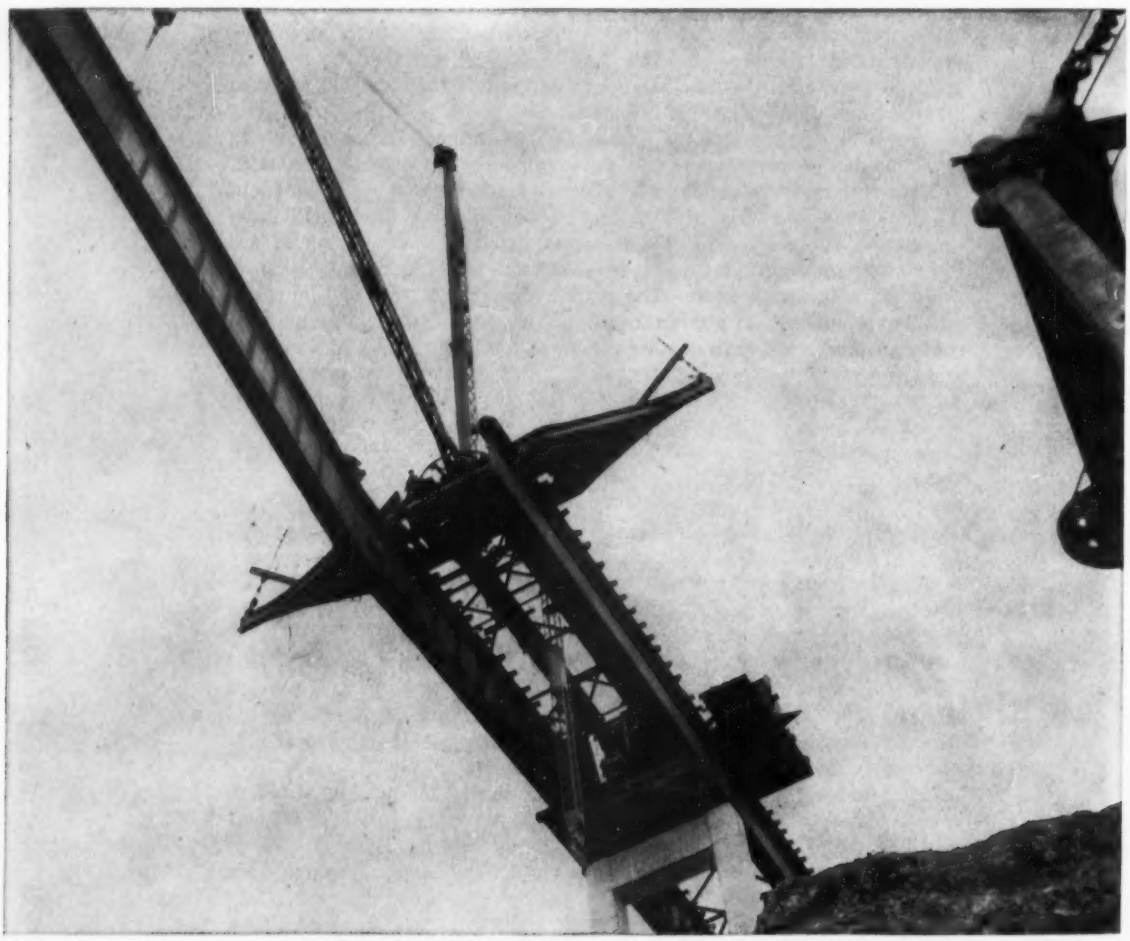
Guy-Derrick Traveler Erects High Spans

LONG GIRDER weighing 34 tons is hoisted 150 ft by special derrick, anchored to opposite canyon walls with long guys.

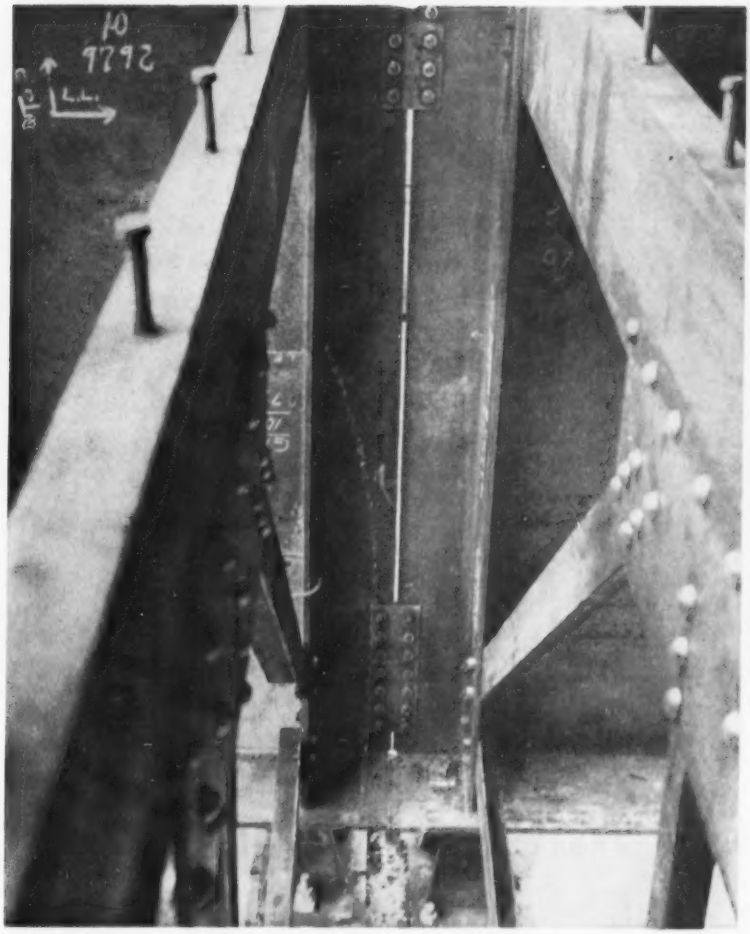
A NOVEL ERECTION METHOD was called upon to span a pair of steep mountain gorges in northern California. Bethlehem Pacific Steel Corp. ran a special guy derrick over narrow temporary steel-girder cantilevers, hoisted 107-ft girders from the canyon floor, and then converted them to simply supported spans.

Normally, such long units are erected on falsework. But the bridges were 150 ft high, and falsework was not economically feasible. Besides, it was the rainy season, and flash floods were a constant hazard.

The two bridges span Pope Creek and Putah Creek in Napa County. They consist mostly of 164-ft twin



OUTRIGGERS provide lateral support for derrick mast. Rig is perched at end of temporary cantilevered girders. Steel strut shown hanging below girders is hoisted into position when derrick travels to brace mast. Adjusting guys is tricky.



SPLICE of temporary cantilevered girders at top of pier is made by welding flanges and joining webs with bolts. Later, splice is cut and excess girder length removed.

plate girders spaced 18 ft apart. Pope Creek Bridge is 572 ft long, and Putah Creek Bridge is 814 ft long.

Bethlehem's problems started right at the beginning of the job. The remote area is reached only by steep, winding roads, and a 74-ft length of girder was the maximum piece that could be hauled by trailer.

To facilitate handling, each 164-ft span was fabricated in three pieces—two 57-ft lengths and one 50-ft length. Webs are 7/16 in. thick and nearly 10 ft deep. The 30-in. flanges vary from 1¼ to 2 in. thick.

At the Pope Creek Bridge, the first span was placed with falsework because it was on the side of the hill. A guy derrick set on the abutment erected the first two-thirds of the 164-ft span on the timber tower, then moved out to complete the span to Pier 1.

Beyond this point falsework was not economical. Instead, the guy derrick hoisted a 57-ft girder from the canyon floor to the top of the pier. Here it was spliced temporarily to Pier 1 so that it would serve as a cantilever. The splice was made by welding and bolting at the top and bottom of the girders. Cantilever sections were fabricated 4 in. longer than the design length to make the temporary splice.

When the 57-ft cantilever was secured, the guy derrick pulled itself out to the end of the girder. Mounted on a platform equipped with outriggers, the derrick was guyed to both walls of the canyon and also to the outriggers. These extremely long guys were tricky to handle when the derrick traveled. So, the mast was braced to the platform with a steel strut. Between moves, the strut was hung between girders.

While the traveler moved ahead, a 50- and a 57-ft girder section were welded together 150-ft below on the canyon floor. A 50-ton American crawler crane handled the assembly.

When the 107-ft long section of girder was ready, the guy derrick hoisted it into position where it was bolted to the end of the cantilever and placed on rockers at the top of Pier 2. The splice at the cantilever was made with 1⅛-in. high-tensile bolts at the flanges and 1-in. high-tensile bolts at the web.

Method Repeated

The cantilever method was repeated on the five long spans of the two bridges. And to convert the girders back to simple spans, one end was jacked 16 in. by two 50-ton jacks. The stress at the cantilever points was relieved, the bolts were removed, the extra 4 in. trimmed with a torch, and the girders lowered on to permanent rockers.

Pairs of girders were tied together with lateral trusses of tees and channels. Members were spliced on the ground by welding and spliced in the air by high tensile bolts.

The two bridges were designed by the California State Division of Highways for the County of Napa. General contractor was John C. Gist of Sacramento. Steel work was by Bethlehem Pacific Steel Corp.

DEEP GIRDER section is hauled on trailer over rugged mountain roads to bridge site.

PAIR of 40-ft high circular tanks go up fast on rock shelf cut out of mountainside. Roofs 9-in. thick are supported on nine 20-in. round columns. One-in. thick tank walls will be prestressed vertically with rods, then wrapped with wire under tension.

Big Concrete Tanks Built on Steep

STEEL FENCING draped over cliff prevents loose rocks from falling into work area.

THE SIDE of a steep hill is anything but the best place to build a pair of big concrete tanks. But that's what J. F. Chapman & Son, is doing near Millburn, N. J. The Hillside, N. J. contractor is constructing two 2,000,000-gal cylindrical structures on an excavated shelf of South Mountain.

Built for the Commonwealth Water Co., both tanks are 93 ft in dia and 40 ft high. Their 5-in. floors thicken to 20 in. under nine 20-in. round interior columns and also under the 1-ft thick walls. Tanks are covered with a 9-in. deck, pitched 3 in. to the center.

To resist internal pressure when the tanks are filled with water, the walls will be prestressed vertically and circumferentially. First they will be stressed by seventy-two 1¼-in. vertical Stressteel rods, and then wrapped with wire under tension and covered with pneumatically placed concrete.

Chapman started the job by cutting out haul roads with dozers. Then he moved in a Northwest 1¾-yd shovel and removed about 25,000 yd of rock. Fortunately, the rock was seamy and could be excavated without drilling and shooting. The 50-ft deep side-hill cut was made in four lifts. Rock was hauled away by truck and dumped nearby to make fire roads.

Before starting on the tanks, the contractor hung a curtain of steel fencing over the 50-ft high rock wall to prevent stones from falling in the tank area. This is a hazard because the high tank walls are only a few feet from the rock cliff.

Restricted working area made some of the first pours difficult. Normally on tanks of this size, the entire floor is cast first, and then the walls are built up with the crane working from the outside. But at least one-third of Chapman's tank walls are right up against the rock cliff.

He thought of operating the crane from a road above the tanks, but the distance from tip of boom to base of tank was far too long to be practical. Instead, he poured only three-quarters of the base nearest the cliff. The crane then

STEEL FORM PANEL for inside wall surface is positioned. Filler strips curve walls.

CRANE works on left-out portion of floor to reach far side of tank. Wall forms for 40-ft high pour are braced against heavy beams laid against cliff. Scaffold brackets hang from ribs on form panels. Special clamps hold walers to panel.

Hillside

moved in on the open quarter to pour wall next to the bank.

The cylindrical walls are divided into six equal pours, each covering the full height of a tank. To form the curved walls, Chapman rented Economy steel panels. He ordered enough for 2½ pours, which permits a pour every three days.

The basic Economy panel is 30 in. square and consists of a steel plate backed with flanges and ribs. Adjacent plates are joined at the flanges with simple steel clamps. Opposite panels are tied together with three steel bars that also serve as spreaders. The bars are inserted through corresponding slots in each panel and locked outside the panels with pins. One such spreader tie-bar is placed at the center of the panel, and the other two at the top. The base of the panel needs no ties because it is clamped to the lower panel.

Normally, Chapman would have started his walls by erecting the inside panels and bracing them to the inside of the tank. But the crane had to work inside the tank to pour the wall sections nearest the cliff. So, for those sections the outside panels were assembled first and braced to 50-ft long, 36-in. steel beams laid against the bank.

On all other parts of the wall, the form is braced to scaffolds on the inside of the tank. Braces are connected to the forms at walers clamped to the steel panels.

To help get the proper wall curvature, and also to assure the exact wall circumference, vertical filler panels of various widths are inserted between adjoining panels.

Reinforcing rods and vertical Stressteel rods are tied in place after one side of the form is erected. On the side closest the crane, specific panels are left out so that concrete can be placed easily in all parts of the form. These panels are replaced as the concrete builds up inside the form.

Scaffolds are hung from both sides of the form panel. On the outside, the brackets simply are pinned to holes in the ribs. To hang brackets from the smooth inner side of the panel, Chapman modified some spreader-ties so that they support the brackets.

A typical 73-yd wall pour requires about 6 hr. Concrete is vibrated internally and externally. The tank's outside surface does not require a smooth finish because it will be wrapped later and gunited.

After 72 hr the forms are stripped and stockpiled for reuse. It takes about five days to set them up for the next pour.

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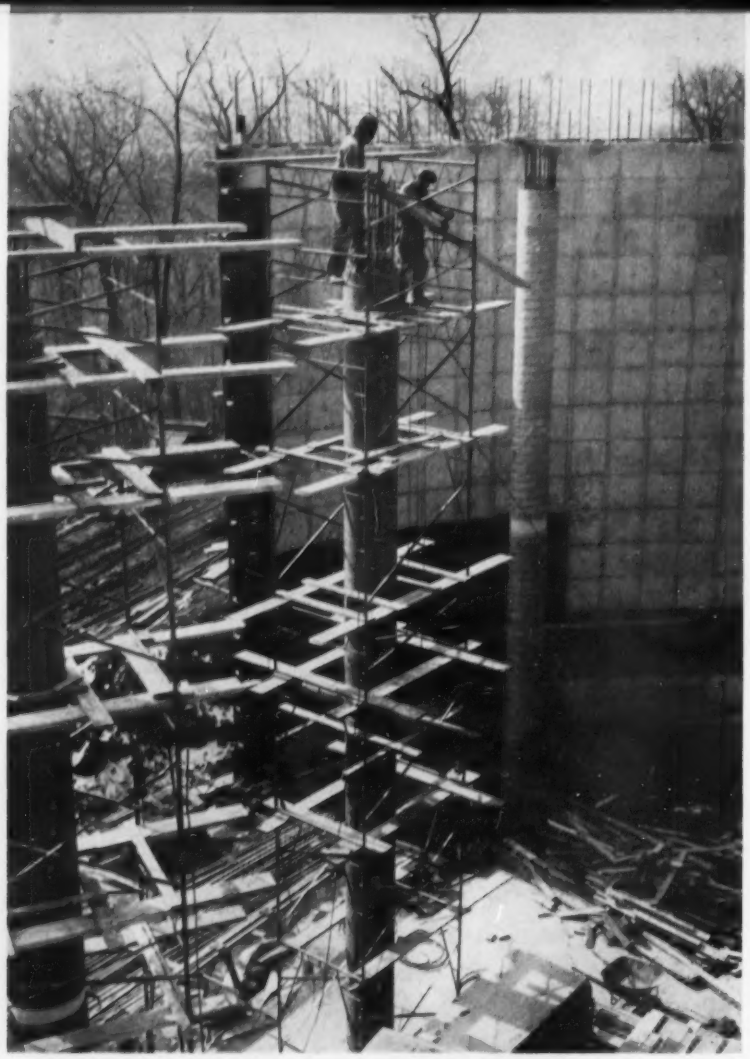


ROUND COLUMNS poured in two lifts inside Sonotubes are braced by guyed steel scaffold towers. Timber yokes grip 20-in. column at five points. Here, workers strip yokes.

BIG CONCRETE TANKS . . .
continued

Scaffolds Support Columns and Deck

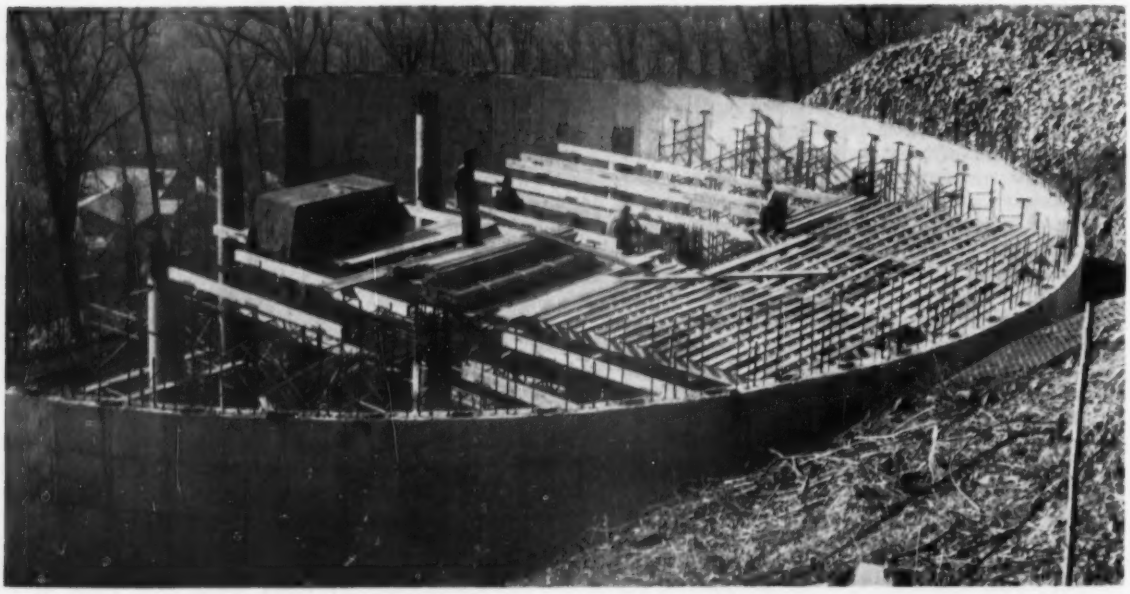
As wall construction progresses, columns and deck sections are added. Columns are poured in two lifts inside Sonotube forms. Each form is held in position and supported by a surrounding Patent scaffold tower guyed to the base of the tank. Timber yokes mounted on the tower support the form at four points.

The 9-in. deck is made in about six pours. Conventional wood forms are supported by adjustable steel scaffolds. Where there is a large gap between the outer ring of scaffolds and the curved tank wall, a ladder section is attached to the sides of tower.

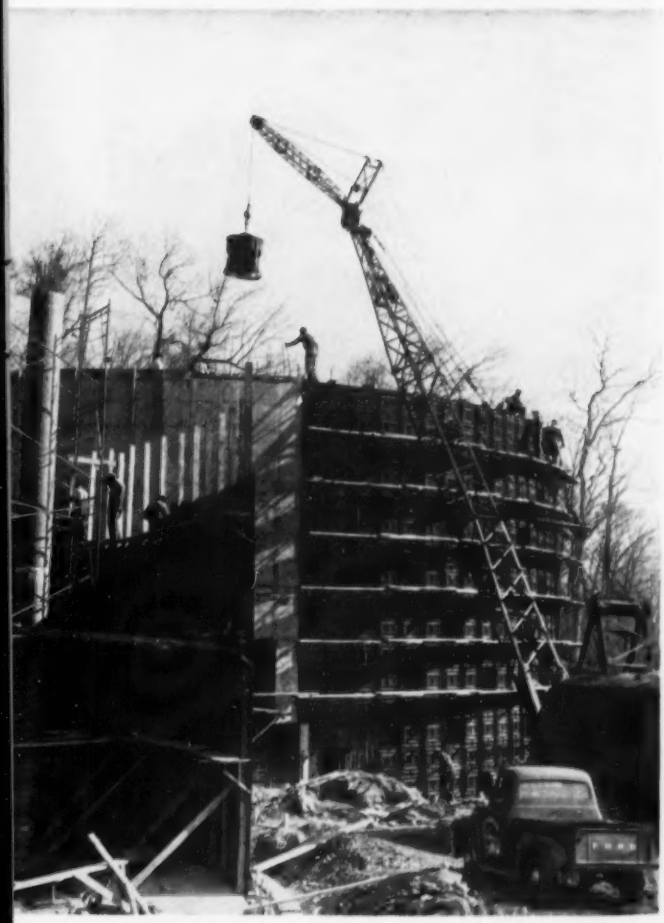
Chapman rented enough scaffolds for about one complete tank deck, which allows him to work on both at the same time. Towers are hoisted intact by crane from one tank to the other. When the last deck pour is completed, the supporting scaffolds are dismantled, bundled, and removed through a hole in the deck, later filled in.

Decks are poured by a crane, operating either at the base level of the tank or on a road overlooking the site, depending on the area being poured.

Concrete is spread and screeded by hand and then finished by a new type float. Distributed by R & R



ROOF FORMS are supported on sectional steel shoring. Contractor rented enough shoring for one tank. Towers are moved intact to other tank. Inside tanks they are rolled. Any excess gap between tower and wall is filled by ladder attachment.



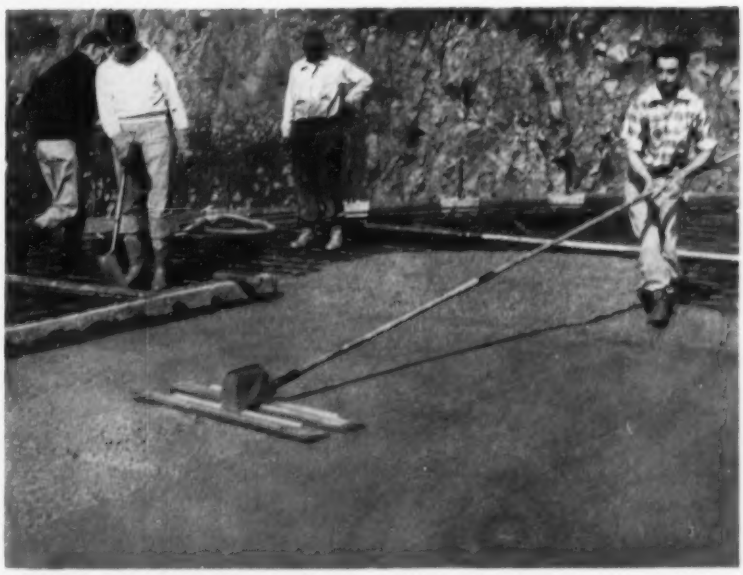
BUCKET of concrete is swung over tank roof by Northwest crane. Wall pour is ready for next day. Left-out panels aid placing.

ROOF is poured in six sections. After last pour, remaining shoring is dismantled, bundled, and passed out of small hole in roof.

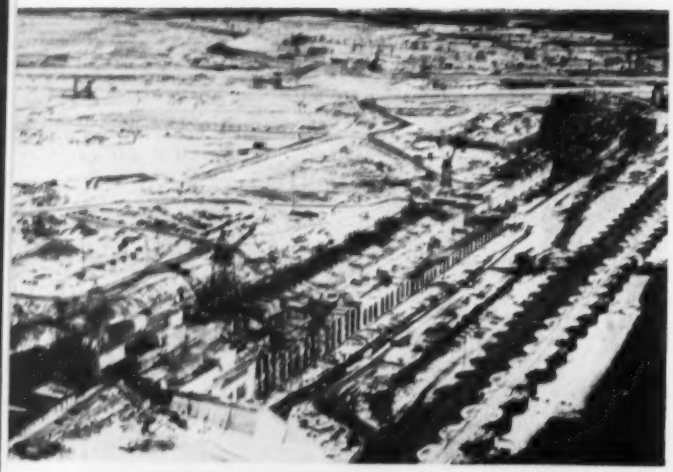
Equipment Co. of Hillside, N. J., it consists of two parallel floats mounted under a device that tilts the floats automatically. When the operator pushes the rig, the double floats tilt one way; when he pulls it back, they tilt the other way. This prevents the floats from digging into the concrete, assures a smooth finish, does not require a highly skilled operator, and reduces operator fatigue.

The angle at which the handle is held has no effect on the operation of the float. Sections can be added to produce a handle up to 30 ft long. The basic rig comes with aluminum floats, but wood units can be bolted on if the contractor desires a rougher finish.

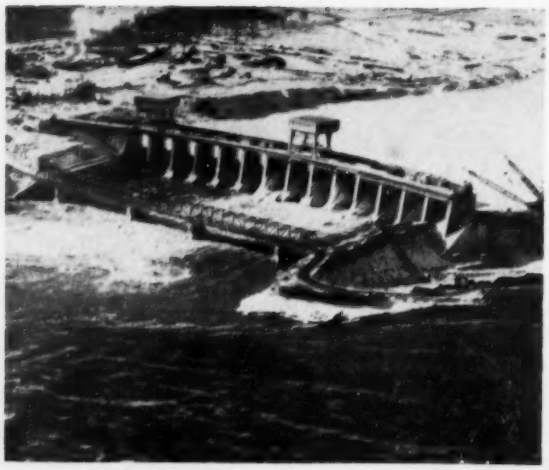
Ken Ryman is superintendent, and Herb Connington is carpenter superintendent for J. F. Chapman & Son. Prestressing will be handled by the Preload Corp. of New York.



FLOAT features double blades that tilt automatically in direction of travel, regardless of angle of handle. It comes with aluminum or wood blades. Handle is adjustable.

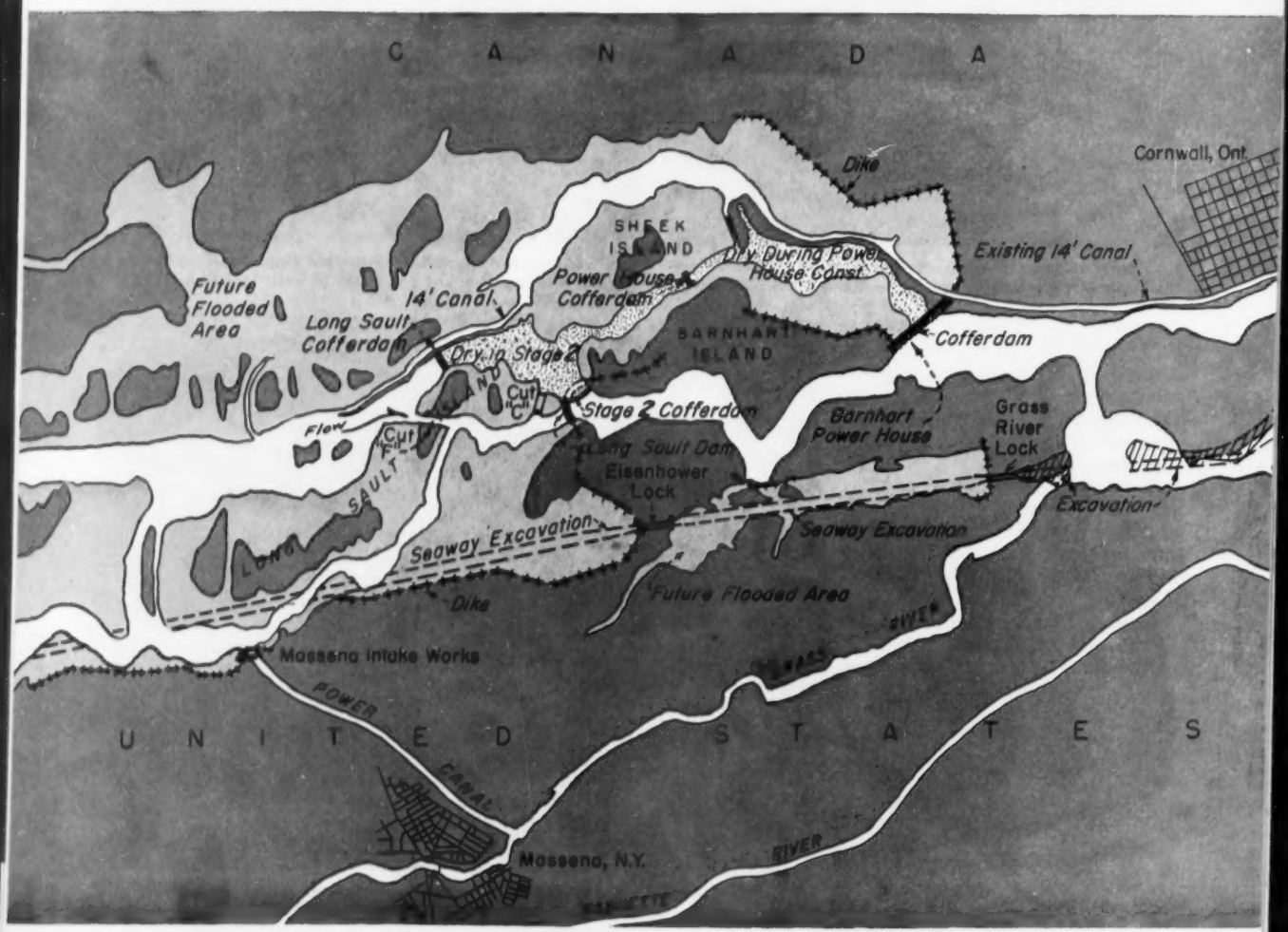


BARNHART POWER HOUSE—Big push will regain ground lost to Canadians this winter. Gantry cranes place concrete.



LONG SAULT DAM—When river diversion is completed this month, stage 2 will proceed at top speed behind cofferdams.

St. Lawrence Project—Biggest Year



MASSENA INTAKE—With plugs excavated, second-stage construction awaits completion of cellular cofferdams.

GRASS RIVER LOCK—Two big items this year are 2,250,000 yd of glacial till backfill and 275,000 yd of concrete.

Looms Ahead

AN EARLY SPRING is breathing life into the St. Lawrence Seaway and Power Projects. With few exceptions, contractors now are remobilizing and pushing hard to regain the efficiency and production they were forced to abandon at the beginning of winter.

For many, this will be the last year on the St. Lawrence; for all, it will be the biggest. A good share of them are a few months behind schedule, but confidence is high. If the weather gives them a break, if the men come back, and if they push like they've never pushed before—they'll make it.

First concrete already has been placed at most of the jobs, but it will be some time yet before peak production is reached. Labor is the big problem—especially carpenters. Several big jobs are starting this spring in upper New York State which are sure to drain the already short supply. Contractor representatives are out "beating the brush" to bring back help. But it may be tough. And if a lot of green workers show up, it will take weeks of training before they learn to work efficiently and safely.

Contractor concern over the problem of breaking in new crews is particularly serious this year. And more than once during this mild winter they often have looked longingly at the bee-hive of activity across the international border. Flexible specs permit Canadians to concentrate on a few blocks at a time, pour lifts up to 20 ft high, and wait less time between pours. This means year-round concrete placing, regardless of weather.

Restricted to 5-ft lifts, naturally it was economically unfeasible for the American contractor to pour throughout the winter. Of course, it can be argued that Canadians are forced to work that way because there is no place for workers to migrate in the winter. And this is quite true. But there isn't a single American contractor who is not worrying this spring whether he'll be able to remobilize a top-flight working force.

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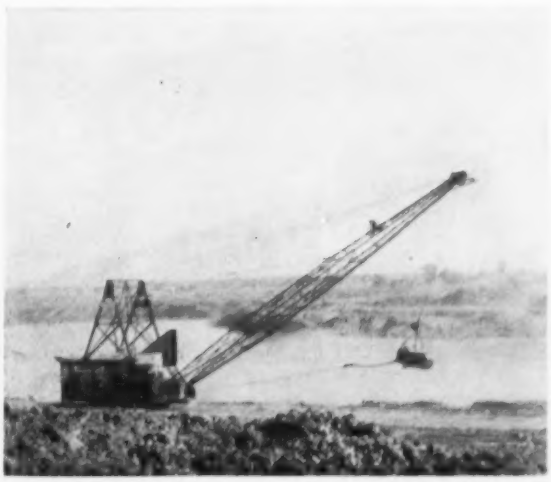
EISENHOWER LOCK—During peak periods, crawler and stiff-leg cranes will place up to 15,000 yd of concrete per week.



SEAWAY CANAL—Draglines, shovels, dredges, and anything else workable will tackle 7,000,000 yd of excavation.

Power Dam—450,000 Yd This Year

AMERICAN HALF of Barnhart Power Dam is readied for early pouring. Concrete was placed at the rate of 800 yd per week throughout the winter in auxiliary structures.

CONCRETE-CARRYING Dumptor bodies are heated during winter by engine exhaust. Hot gases piped to Y-fitting between bodies are passed through hollow stiffening channels.

The only concrete poured on the American side this winter was at Barnhart Power House. And this was only in auxiliary structures. A joint-venture managed by the Perini Corp. placed about 800 yd a week. Aggregate piles were heated by two methods—hot water and exhaust. Heated by two big boilers, hot water was circulated in coils embedded in the stock piles. And the exhaust pipe from the boilers was run the full length of the piles over the reclaiming tunnel.

Hot water was also piped up the hooded incline conveyor leading to the batch plant and was used to heat mixing water. The plant itself was heated with electric heaters.

Concrete was hauled in the special truck-mounted, quick-dumping bodies introduced last year. (CM&E, Aug. 19 '56, p71) To keep the concrete warm in transit, the modified Dumptor bodies were heated by the engine exhaust. A flexible pipe carried exhaust to a Y-fitting between the two bodies. Here, the exhaust entered a box bracket on the side of each body which distributed the hot gases to the channel ribs surrounding each body. By removing all blocked passages in the hollow ribs, the exhaust could make a complete circuit around the body before it discharged through holes in the end. The flow would be broken only momentarily when the body dumped. As the body returned to its normal position on the truck, the box bracket automatically made contact with the Y-fitting, and a spring-actuated gasket sealed the joint.

The only other modification to the truck was the addition of calcium chloride and water to the right tires. The water served as additional counterweight against overturning, and the calcium chloride prevented freezing.

At the point of placement, forms were insulated and Kimsul, and enclosed areas were heated with steam radiators equipped with electric blowers. Steam was supplied by a 300-hp boiler.

Perini resumed full scale concrete operations last week. This year, he is scheduled to place 450,000 yd. Another 70,000 yd will go in early next year.

continued on page 79

How to widen streets fast

This No. 977 Traxcavator* digs concrete, asphalt and compacted earth, loads a truck every 2 minutes, grades as it goes

Vogel Construction Corp. was widening 1.6 miles of 38th Street, Indianapolis, Ind., when this picture was taken. The job included excavating 40,000 cu. yd. of old concrete, digging up front yards and driveways. Street width was increased from 40 to 80 feet. And most of the work was done by a CAT* No. 977 Traxcavator.

Hard earth, broken concrete and asphalt are tough materials to dig, but the machine's superior pry-out action resulted in full bucket loads. The main problem was keeping enough trucks under the bucket. The No. 977 was loading a truck in less than 2 minutes, and it maintained a good level grade as it dug. Vogel Construction Corp. also found the No. 977 good at skimming asphalt off of old pavement.

Caterpillar-built Traxcavators have been designed for one purpose—to increase your production and cut costs. The No. 977, largest of the line, gives you the power and performance for big road jobs. Its 100 HP engine and ample track surface back up the 2¼ cu. yd. bucket with tremendous digging force. Quick-acting hydraulic controls add to the machine's great maneuverability. It's easy to operate and has maximum job visibility.

Balanced weight distribution makes for good stability on rough terrain or steep grades. The 40-degree tilt-back of the bucket at ground level prevents spillage. And the bucket can be raised almost 12 feet for high load clearance.

Get the full story of this rugged, modern excavating tool from your Caterpillar Dealer. He'll demonstrate the No. 977's performance on your own job, and he stands behind its long, profitable work life with dependable service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

BUILT FOR THE HARD WORK

(Advertisement)

Part of the equipment used in the excavating operation at Pima Mine, Arizona. Operations will be completed about January, 1957.

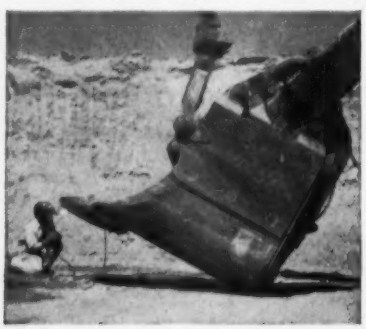
STOODY HARD-FACING in one of the WORLD'S LARGEST OVERBURDEN STRIPPING PROJECTS

A huge stripping operation is in progress a few miles south of Tucson, Arizona, at the Pima Mine where Utah Construction Company is moving 6,000,000 cubic yards of overburden, including 600,000 yards of waste rock, to expose the copper ore deposit 210 feet below the surface. The job was begun in October of 1955 and will probably be completed by January of 1957.

An unusual feature of this project is the method of moving the overburden, a highly abrasive alluvial soil. Instead of the usual blast hole equipment, shovels and dump trucks, the job is primarily handled with rippers and scrapers. After the rippers make a pass, scrapers pushed by crawlers pick up the loose material and haul it to a fill. The equipment inventory includes a D9 Cat ripper, an HD21 A-C ripper, 10 MRS scrapers, two Cat 12 motor graders, six A-C and two D9 Cat pushers, four LLD 30-yard trucks, a Marion 7-yard shovel, a Michigan dozer and two water wagons.

One out of three shifts is devoted to maintenance and repairs. Hard-facing of many pieces of equipment is speeded up by the use of the semi-automatic welder applying Stoody 100. On ripper and bucket teeth which are subject to severest wear, Stoody Tube Borium is applied manually as a final overlay.

Hard-facing methods used here are described in the Stoody Guidebook and the folder on semi-automatic wires. See your Stoody dealer for a copy of this literature (check the yellow pages of your phone book) or write direct.



SHOVELS AND TEETH—at noon and at the end of the second shift tooth points are touched up with Tube Borium. Three stringer beads on the tooth are equivalent to a full inch of bare tooth wear. With this treatment teeth usually last six to eight shifts. Repointer bars are welded on worn teeth, hard-faced semi-automatically with Stoody 100 and finished off with Tube Borium.

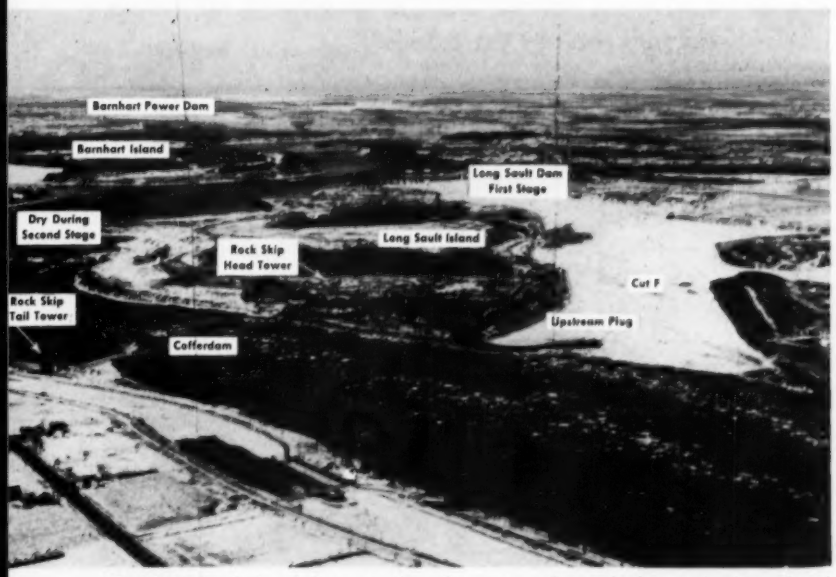
SIDE BLADES ON LOADERS—are subject to severe wear from "scooping" action. Stoody 100 holds it in check.

STOODY COMPANY
11972 East Slauson Avenue
Whittier, California

OPEN GATES in temporary position on first stage of dam allow river's south channel to pass through. North channel, foreground, will soon be dry when rock cofferdam upstream is completed. Three gantry cranes wait behind cellular cofferdam.

ST. LAWRENCE PROJECT . . . continued

Long Sault — Ice Jam Slows Diversion



ICE JAM behind dam halts excavation of upstream plug and also construction of rock cofferdam. Fast opening and closing of gates finally broke ice and released jam.

Perhaps the most dramatic job on the project is Long Sault Dam. Unlike Barnhart Power House, which is built in one stage entirely in the dry, the builders of Long Sault are fighting a three-year battle with the St. Lawrence River. It would be tough enough just diverting the river three times, but the contractor is prohibited from working in any way that will disturb the natural level of the river. If he exceeds a 2-ft tolerance, he can cause serious problems upstream. City water supplies, canal levels, and shoreline structures all would be affected.

Half of the dam was built last year behind a cellular cofferdam while the south channel of the river was diverted through an excavation called "Cut C." During this construction, a huge excavation known as "Cut F" was under way across Long Sault Island. This cut is designed to divert the north

ST. LAWRENCE PROJECT . . .
continued

channel through the partially completed first half of the dam. At the same time, a rock cofferdam placed by cableway was started across the north channel to divert the channel into "Cut F" and dry the entire river area behind the second half of the dam.

Maintaining the upstream river level during the diversion was a problem of balancing the construction of the rock cofferdam against the excavation of the upstream plug of "Cut F." It was nip and tuck all the way. If the cofferdam was built up faster than the plug was removed, the river might back up. And if it was not built fast enough, the upstream level could drop.

Unfortunately, troubles began to multiply even before the diversion started. Because the concrete work on the first half of the dam got somewhat behind schedule, the excavation of the plug was not started until December, a few months late. At the same time, the rock cofferdam was well under way. About the time the plug was half removed, which was late in February, ice began breaking upstream and floating down the river. Unfortunately, a prevailing northwest wind coupled with the strong current heading into "Cut F" soon filled the entire area behind Long Sault Dam with a hefty ice jam. The situation grew steadily worse because the rock cofferdam was too high to encourage any new ice to go in that direction.

Eventually the ice packed so tightly around the end of the plug that the contractor could not get even a dragline bucket into the water. They worked hard casting ice to one side, and made some progress, but eventually the ice locked so tightly around the plug that they suspended operations.

Meanwhile, engineer and contractor officials schemed to release the huge jam behind the dam. Opening more gates could keep the river from backing up, but it only brought in more ice.

The answer seemed obvious, even if a bit hazardous. They reasoned that if they opened a few gates and allowed the water under the ice to draw down quickly, the ice might deflect and crack. Then, if they closed the gates suddenly, a surge of water would roll back under the ice and cause further cracking.

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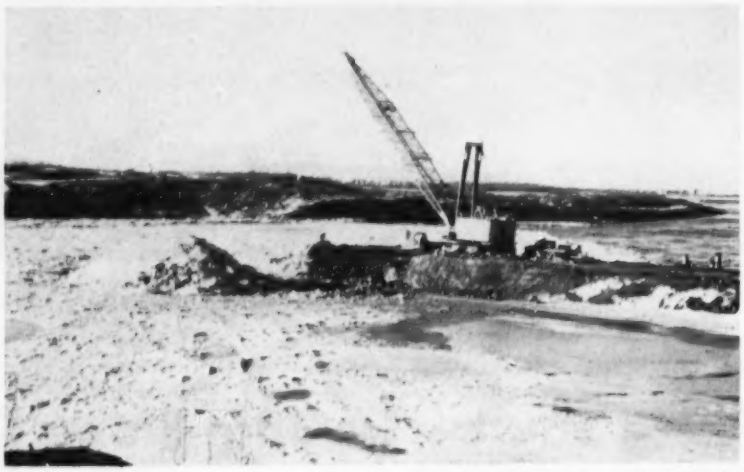
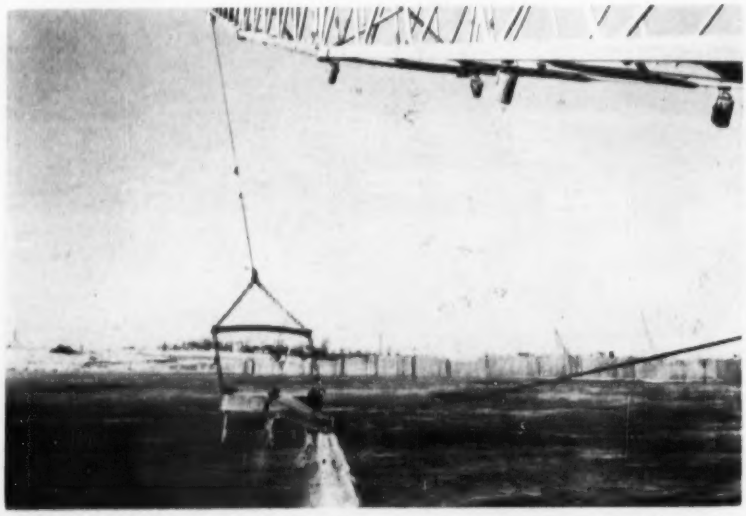
PLUG EXCAVATION is extremely difficult during ice jam. Manitowoc dragline casts ice to try and expose end of plug and resume digging, but eventually, contractor had to stop work.



BROKEN ICE JAM permits resumption of plug excavation. Native till in plug must be drilled and blasted. At right, work also resumes on cableway-placed rock cofferdam.



ROAD-TYPE RIPPER with wheels removed is suspended by dragline cables. Both at plug and Iroquois Dam, it scrapes unblasted bumps of cemented till from riverbed.

EATON 2-SPEED AXLES

Keep Trucks Out of the Shop!

Whenever you cut down on wear and tear—keep trucks on the job, out of the shop—you're adding to profits three ways: 1—By keeping trucks *earning*, not *costing*. 2—By saving the expense involved in interrupted service and delayed trips. 3—By cutting actual parts-and-labor maintenance costs.

That's exactly what Eaton 2-Speed Axles do. By furnishing the *right* gear ratio for every operating condition, they reduce stress and wear on engines and all power transmitting parts. In addition, Eaton 2-Speed Axle trucks last longer, haul more at lower cost, and are worth more on the trade-in.

It all adds up to this: when you specify Eaton 2-Speed Axles, you're swapping *expenses* for *profits!*

More than Two Million Eaton Axles in Trucks Today. For complete information, see your truck dealer.

EATON

AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioning Fastening Devices • Cold Drawn Steel • Stampings • Gears • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Highway viaduct demonstrates **Three**

# of fir plywood

Fir plywood solved complex form problem on Alaskan Way Viaduct.
The ¾ mile double-decked structure required only 400,000 square feet of plywood.

key advantages concrete forms

Beam and girder bottom forms were built up inside standard vertical form panels in what contractors called "floating beam bottoms," to handle variable beam and girder depths.

1. time and labor savings

On this six-lane Seattle highway viaduct, standardized fir plywood form sections helped complete the job months ahead of schedule. Fir plywood forms were used for beams, girders and road slabs.

2. economy through re-use

About 400,000 square feet of 5/8" fir plywood was required for the 3/4 mile double deck structure. Contractors reported an average of four re-uses. About 25% of the fir plywood forms gave 10 uses.

3. smooth, fin-free concrete

The smooth surfaces obtained with the plywood forms cut finishing to a minimum, the contractor reports. Job Superintendent John Rumsey, Jr. says: "Fir plywood solved a complex form problem for us and speeded work all along the line."

Pattern of plywood forms for girders and cross beams is shown here. Standard panels for shallow cross beams and shallow center beams were not as high as those for girders.

DFPA TESTED QUALITY

ALWAYS SPECIFY BY DFPA GRADE-TRADEMARKS

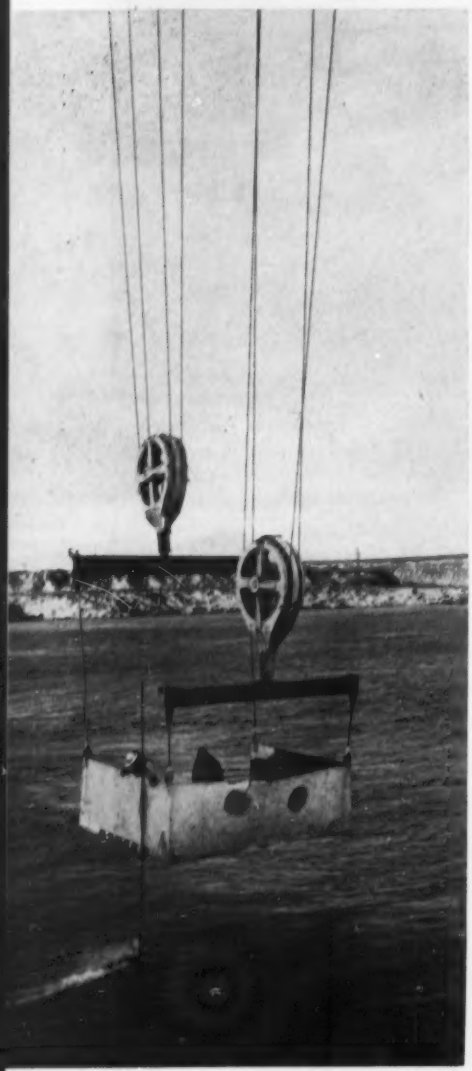
INTERIOR PLYFORM®—standard concrete form grade made with moisture-resistant glue. Gives multiple (10-12) re-uses.

EXTERIOR PLYFORM® —standard form grade made with waterproof glue. Gives maximum (25 or more) re-uses.

OVERLAID FIR PLYWOOD—special panel with hard, glossy fused resin-fiber surfaces. Waterproof glue. Up to 200 re-uses.

FOR YOUR FILES: Complete application-specification-design portfolio assembly. Write (USA Only) Douglas Fir Plywood Association, Tacoma 2, Washington, Dept. 136.

ALASKAN WAY VIADUCT
LOCATION: Seattle, Washington
CONTRACTORS: Morrison-Knudsen Co., Inc.
Rumsey and Company



SURVEYORS take soundings on rock which has been dumped from cableway skip.

HUGE CHUNKS of floating ice knock out section of contractor's bridge crossing power canal at Massena Intake. Big pipe alongside is still intact, despite lost support.

When the jam showed no signs of breaking up by itself, the engineers authorized the contractor to maneuver the flood gates. Two gates were already open and a third was added. Then the two huge 300-ton gantries each latched on to a gate and opened it quickly. After a few minutes they closed them again, causing a surge of water to rush back under the ice.

This process was repeated many times during the next few days with little visible result. Then, in a matter of minutes, cracks began to appear all over the jam, and within an hour all the ice broke up and cascaded through the dam.

With the ice gone, the contractor went back to work on the half-excavated plug at the upstream end of "Cut F". They worked around the clock, but it was tough going.

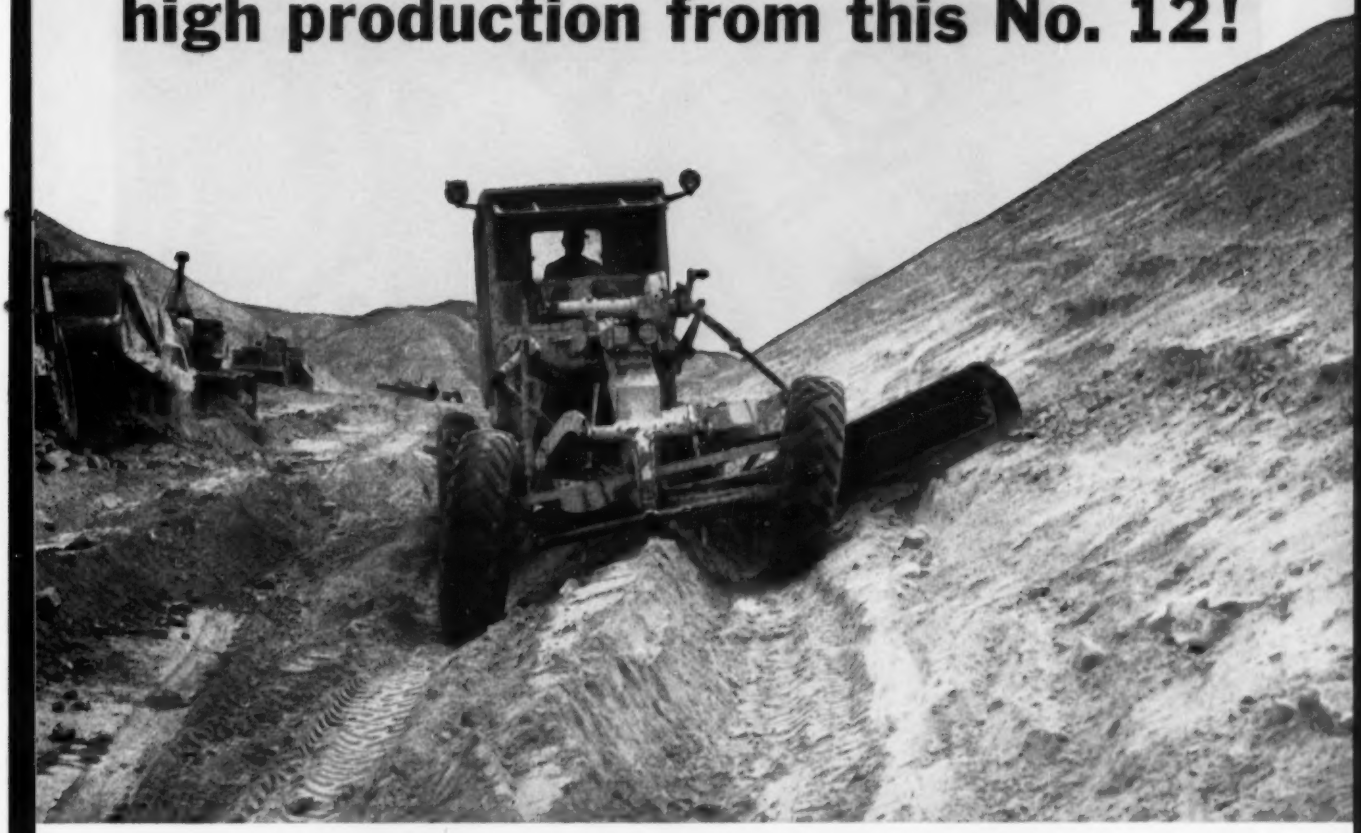
The plug was native glacial till 50 ft wide at the top and 33 ft deep. Originally, it was 1,150 ft long. They used the only method that St. Lawrence contractors have found for moving the cemented till —drilling with large rotaries and shooting. With Mayhew drills, they sunk about four 5⅝-in. holes per shot. Sticks of dynamite were lowered into the holes and surrounded by DuPont Pelletol water-impregnable dynamite pellets dumped from above.

After a shot, blasted till was removed by dragline and hauled away. Often, the shot would leave bumps remaining near the grade line. To remove these, the dragline bucket was replaced with a conventional tractor-drawn ripper with the wheels removed for better handling.

As plug excavation neared completion, work was resumed on the cableway-placed cofferdam across north channel. This cofferdam is now close to completion, and nearly all flow is passing into "Cut F" and through the gates of the dam. The north channel is now beginning to dry, and a rock cofferdam is being built just downstream of the second half of the dam. Heavy excavation will be carried on this spring behind the cofferdam, and concrete work will be in full swing by the summer.

continued on page 87

Why Mr. Thorn expects and gets high production from this No. 12!



Besides bank sloping, this Cat No. 12 Motor Grader maintains haul roads for DW21s and DW10s on the 9.2-mile realignment of U. S. 91 near Mesquite, Nevada. Note D8 in background.

PAUL A. THORN

"We have owned Caterpillar products since 1927," says Paul A. Thorn, President of Thorn Construction Co., Inc., Springville, Utah. "We're firm believers in them because of economy, minimum down time, long life and constant engineering improvement. We also think that Caterpillar Dealer service is in a class by itself."

Speaking from 29 years of successful experience, Mr. Thorn now has a Caterpillar line-up that includes thirteen D8s, five DW21s, two DW10s, seven Diesel Engines, one Diesel Electric Set and six No. 12s. This No. 12, with 9999 hours on its hour meter, was part of the company's rugged yellow team on a 9.2-mile realignment of U. S. Highway 91. The contract involved moving 1,500,000 cu. yd. of dirt. Working 10 hours a day, 5 days a week, the No. 12 contributed its full share to money-making production.

Now an even more productive CAT* No. 12 Motor Grader

As good a machine as this "old" No. 12 has proved itself, there's even *more* work at *lower* cost with *less* down time built into the new No. 12. Constant engineering improvement is the reason. For example, the new No. 12 has an exclusive oil clutch that can operate up to 1500 hours without adjustment. New tubeless tires, now standard, save time and money by eliminating an estimated 80% of down time due to tube and flap repair and by providing longer tire life. These and other features add up to a new standard of grader performance!

Another point well worth considering: your Caterpillar Dealer backs you with prompt service whenever and wherever you need it. He has the trained mechanics and parts to do the job *fast* and *right*. See him for complete facts about the practical, advance-design features of the No. 12. Name the date—he'll be glad to demonstrate!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

99% OF ALL CAT MOTOR GRADERS ARE STILL IN USE

"We're sold on

NYLON CORD TIRES"

—says N. W. Narehood

Vice President, Narehood Bros., Inc., Milton, Pa.

"We get longer wear, more retreads, fewer failures with nylon cord tires"

"Our road delays due to tire failures are down 90%. We used to have plenty of blowouts, particularly in hot weather. Now they're a rare thing!

"Six days a week, 12 hours a day, we move our 20-truck fleet over a 150-mile radius from the quarry to road-construction sites. The trucks roll over piles of blasted rock with 16-ton loads, yet some of our nylon cord tires have seen over 125,000 miles' service. We've found nylon cord tires have the extra strength to take day-in, day-out punishment and still give us good service after three retreads. You can see why our tire costs are down and why we've authorized total replacement with nylon cord tires for our fleet!"

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads, at the lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

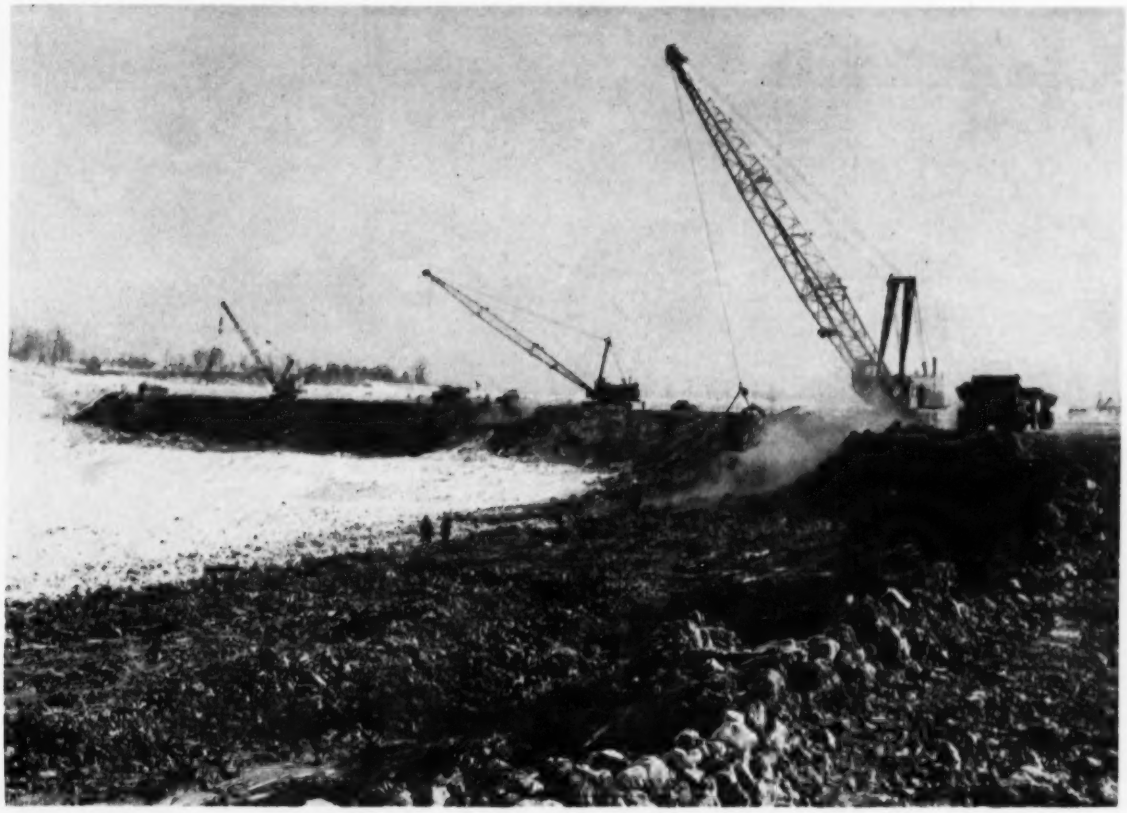
DU PONT NYLON FOR TIRE CORD

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

DU PONT

REG. U. S. PAT. OFF.

FOR TRUCKS AND PASSENGER CARS, TOO . . .
THE STRONGEST, SAFEST TIRES ARE MADE WITH NYLON CORD



MARINE CLAY excavation continues throughout winter at Eisenhower lock. Crane at left breaks frost with steel ball while two Manitowoc draglines excavate tough material.

ST. LAWRENCE PROJECT . . . continued from page 84

Seaway—Two Locks Plus 10-Mi Canal Cut

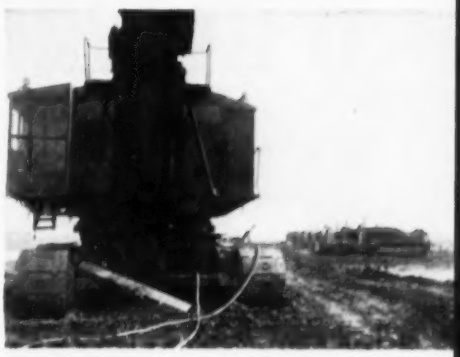
The three big jobs on the Seaway are Grass River Lock, Eisenhower Lock, and the 10 mi of canal excavation west of Eisenhower Lock and between the two. Although only about 35% complete now, all three projects are scheduled for completion by the end of the year.

Although no concrete was placed this winter, a lot was accomplished by the three contractors. At Grass River Lock, a joint-venture firm managed by the Perini Corp. excavated more than 1,000,000 yd of marine clay and drove 8,000,000 lb of sheet piling for guide-wall foundations.

Plenty of marine clay also was excavated at Eisenhower lock and adjacent canals. The lock is being built by a joint-venture firm managed by Morrison-Knudsen Co., and most of the canal excavation is by another joint-venture firm, managed by Peter Kiewit Sons' Co.

Winter is the ideal time for working marine clay. When the crust freezes, haul roads can be maintained easily and spoil areas can be worked without the difficult sloughing that takes place in summer. Marine clay becomes like soup in warm weather and is virtually impossible to handle. In winter, it's strictly a dragline operation. Big rigs with 5 and 6-yd buckets stand on canal banks, scoop solidified clay, and dump mostly into Euclid end-dump trucks. With their bodies heated by their exhaust, the big Eucs are able to dump the clay at spoil areas. But it's not easy. If the weather gets too cold, clay sticks

continued on page 91



IDLE RIGS sitting out cold winter are now on the move. For long trips to new areas, big shovels like this Bucyrus-Erie electric are knocked down and hauled on trailers.

The new Wooldridge "Cobrahaul" Rear Dump Unit with Fuller 9-speed R-1150 ROADRANGER Transmission.

FULLER R-1150 ROADRANGER® Transmission standard on new Wooldridge "Cobras"!

The Fuller 9-speed R-1150 ROADRANGER Transmission is *standard equipment* in the new Wooldridge 35-ton, 275 hp diesel "Cobrahaul" Dumper and 26-yard 300 hp diesel "Cobra Quad" Scraper. Haul speeds exceed 32 miles an hour on the big 63,400 lb. unit.

Throughout the complete Wooldridge line . . . from the giant 41-yard scrapers down to and including the 7.5-to-10-yard "Cobrette," Fuller Transmissions are standard on Wooldridge Scrapers and hauling units.

Why? Only the most rugged, dependable transmissions can take the terrific shock loads—sudden starts—stops—torque reversals found in all kinds of off-highway operations from solid rock hauling to soggy swamp jobs.

Fuller Transmissions provide maximum ease of shifting ratios for faster acceleration and long life required for these operating conditions.

In Wooldridge's "Cobrahaul" and "Cobra Quad," the Fuller R-1150 ROADRANGER Transmission offers these additional advantages:

- **No gear splitting—9 selective gear ratios evenly and progressively spaced**
- **Easier, quicker shifts—38% steps between ratios**
- **One shift lever controls 9 forward and 1 reverse speeds**
- **Engines work in peak hp range with greater fuel economy**
- **Less driver fatigue—⅓ less shifting**
- **Range shifts pre-selected—automatic and synchronized**

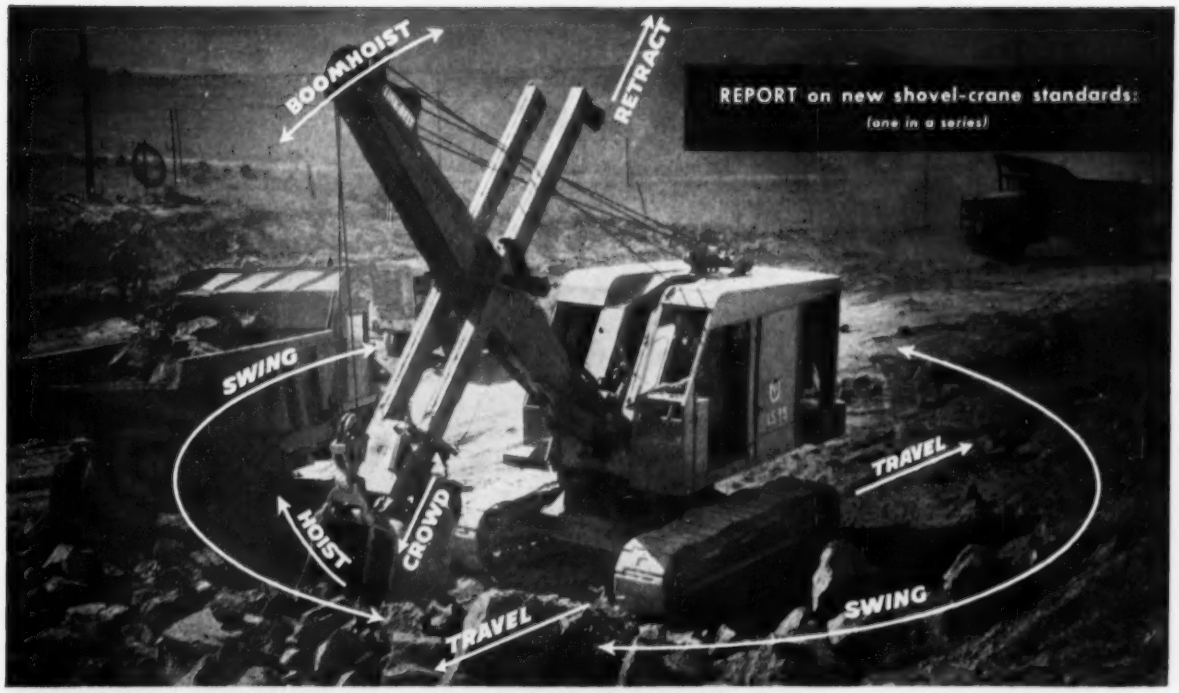
From over 110 models available for rubber-tired equipment, there's a Fuller Transmission designed to do your job.

really where horsepower goes to work

Fuller TRANSMISSIONS®

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.



ALL OPERATIONS ARE COMPLETELY INDEPENDENT — In addition to eliminating shifting time, *Independent-Travel* allows the operator to swing and hoist the load while travelling. Whether to save time or to jockey the boom around obstacles, the operator can swing the boom while his machine is travelling in either direction. This optional feature can be used with any front-end attachment.

Getting 9 hours' output in 8

Independent-Swing-and-Travel is available on 11 Link-Belt Speeder models. Eliminates shifting . . . saves 20-30 seconds each move

Link-Belt Speeder users are setting new high-production standards by equipping their machines with *Independent-Swing-and-Travel*. Why? It eliminates time losses ordinarily occurring when the operator shifts from swing to travel and from travel to swing. With *Independent-Travel* shifts are eliminated and the machine can swing and travel simultaneously . . . you can jockey the boom around obstacles in tight quarters, move away from bank cave-ins in split seconds!

If you'd like complete details, proof that *Independent-Travel* can up output . . . cut maintenance and spare parts costs, too — see your Link-Belt Speeder distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

MORE USABLE HORSEPOWER — Size for size, Link-Belt Speeder shovel-cranes utilize more of the engines' available horsepower. This bonus pays off in added power at the bucket teeth, greater line pull plus extra power to swing, hoist and travel. Although it gets more usable power and line pull out of the same engines used in other shovel-cranes, a Link-Belt Speeder remains well within the engine manufacturers' recommended operating speeds.

14,324

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

Roebling Royal Blue Wire Rope will **bend** and **bend** and **bend!**

What's more, Roebling Royal Blue is *stronger* than the strongest wire rope previously available. It will do more work and last longer on *your* job. Call your distributor or your nearest Roebling office for full information about Royal Blue, the really better wire rope. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Distributors, Branches and Warehouses Throughout the Country—Subsidiary of The Colorado Fuel and Iron Corporation

IT TAKES a variety of machines to excavate tricky clay and till from long canal. Where clay pockets are large enough, an 18-in. hydraulic dredge is employed. In other areas, conventional shooting, hauling, loading, and spreading rigs do the job.

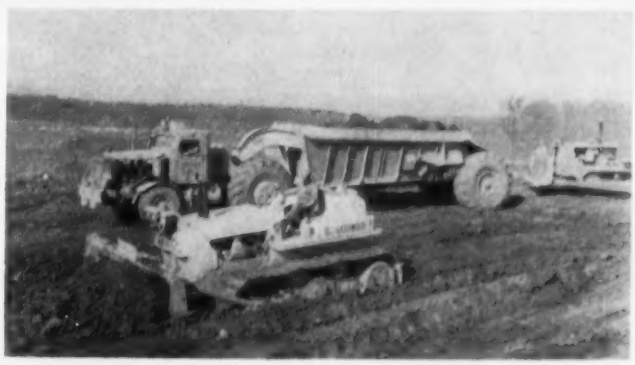
to the bodies and must be removed often. Some contractors scrape it out with dragline buckets; others build extensions on tractor shovels and dig it out.

Long Canal Cut

Biggest earthmoving job is Kiewit's canal excavation. And the conditions are about the toughest on the entire project. His prices are low—and his troubles are many.

The job consists of more than 14,000,000 yd of marine clay and cemented glacial till, the nemesis of St. Lawrence contractors. About 8,000,000 yd is till which must be drilled and shot, and the rest is clay which is about as tricky and unpredictable as you can find.

Neither material lends itself well to any method of excavation. And Kiewit tries them all. It's the only way. The material lies in pockets; in some places it's softer than others, the top is easier to work than the bottom, and the weather has a sharp effect on its characteristics.



To attack marine clay in warm weather, Kiewit uses long-boom draglines where they can cast directly into a spoil area. If the pocket is large enough he works an 18-in. cutterhead dredge. In winter, smaller dragline and hauling units work out because they can ride on the frozen surface.

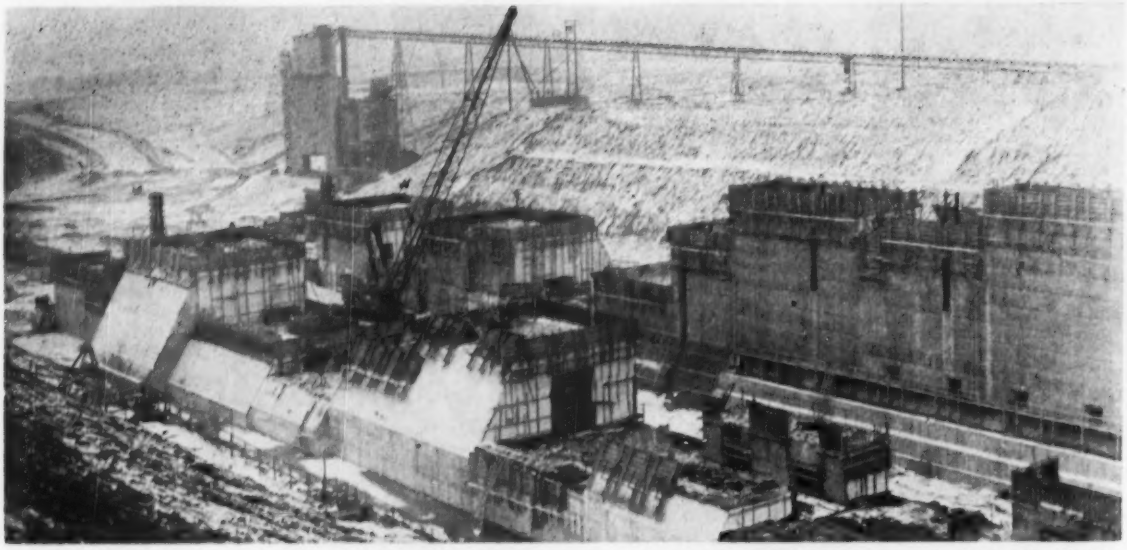
Cemented Till

Glacial till is especially difficult because it is cemented like concrete. On the upper tills, rippers can loosen the leached out material enough to permit excavation by scrapers. But on all other tills it's strictly a drill and shoot proposition.

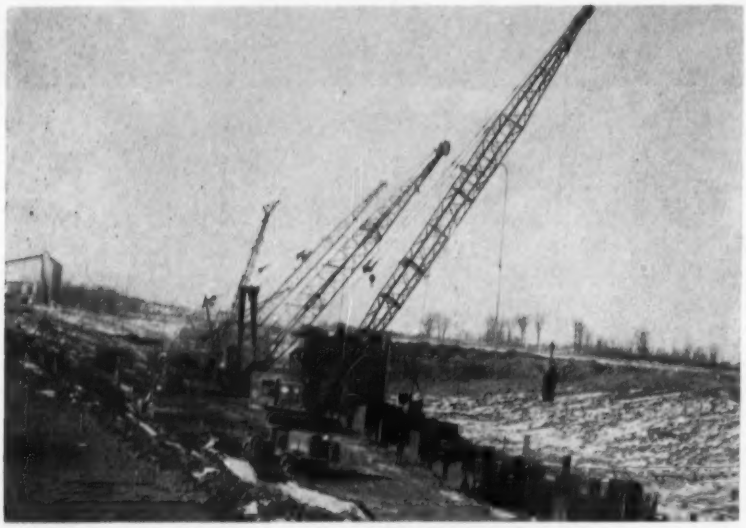
Kiewit's huge equipment force includes 30 dozers, 47 Euclids, 6 electric shovels, 3 walking draglines, 4 power shovels, and 11 scrapers. He already has moved 7,000,000 yd from the canal, and another 7,000,000 is left to go. He worked through the winter until spring thaws turned the canal into mud. Spring rains will further prohibit much work until June 1. And then, "watch the dirt fly" says Clint Arnot, Kiewit's project engineer. The huge fleet of equipment, plus the 18-in. dredge, will work round-the-clock to complete the canal by next winter.

Seaway Locks

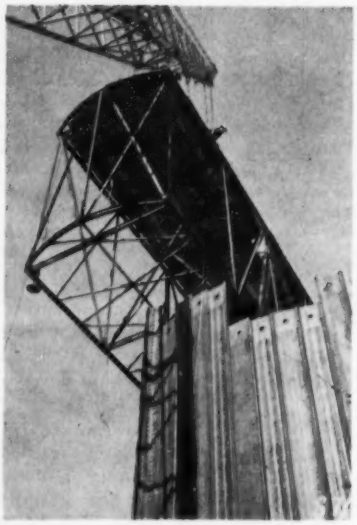
Concrete placing started last week on both locks. Production will pick up each day until concrete is going in at both jobs at the rate of



SNOW BLANKETS inactive Eisenhower lock during winter. But crews returned last week, and contractor is pushing hard to regain last year's top production of 15,000 yd per week. Job is scheduled for completion late this year.



SHEET PILE CELLS for downstream guide wall at Grass River Lock are driven by McKiernan-Terry 9B3 hammer swung from Lima Crane. Other cranes excavate and move templet.



STEEL FRAME TEMPLET for driving sheet pile cells is lowered by crane into position.

12,000 to 15,000 yd a week. They each must place 275,000 yd this year.

Crawler Versus Gantry

The two jobs are quite similar except for concrete placing methods. M-K employs Manitowoc 4500 cranes to pour most of the walls and two stiffleg derricks to pour the complicated sections at the west lock where a tunnel goes through the walls. During the winter, the contractor replaced the crane booms with dipper sticks and worked them as shovels on marine clay excavation.

At Grass River Lock, Perini runs two Washington gantry cranes between the lock walls. Rented from the Navy, they pour quickly and can reach all parts of the main structure.

To speed bucket switching, Perini employs a Gar-Bro automatic hook. Air is supplied continually to the hook by an air hose that hangs from the crane boom. When an empty bucket is placed on the trailer, the hook opens automatically. A worker easily maneuvers it over an adjacent full bucket, where he turns the valve that closes the hook. The rig is designed so that it can not reopen until the bucket is replaced on the trailer. Big advantage is that it cuts valuable seconds off switching time.

Tight Schedule

Time-saving tricks will be plentiful this year as contractors strive in every possible way to stay on their difficult schedules. This should be the year of triumph on the St. Lawrence. Within months, the end will be in sight.

Beat Warm Weather's Perspiration Hazards BOTH WAYS—with these M-S-A items

Absorb the sweat . . .

M-S-A PERSORB SWEAT BAND

Perspiration causes lots more problems than just worker discomfort. Burning sweat-filled eyes, streaked glasses and goggles, and distraction are all build-ups to potential accidents. There's an economical, practical answer to the problem. M-S-A Persorb Sweat Bands.

This product is made of highly absorbent cellulose sponge, with an elastic band to hold it comfortably in place on the wearer's forehead. Perspiration is absorbed as quickly as it forms, keeping face and eyes relatively dry. This evaporation has a bonus value, too. It cools the worker, helps him keep wide-awake, alert. If the sponge gets too moist, a quick wring-out puts it back on the job. Keeping Persorb bands clean is simply a matter of rinsing out in soapy water. They are light, soft, flexible, will not interfere with glasses. Persorb, moistened in cool water before putting on, gives extra comfort in hottest temperatures. Write for details.

Replace the salt

M-S-A SALT TABLETS AND DISPENSERS

This complete line of dispensers and salt tablets is the economical answer to a vital need—replacing body salt lost through perspiration.

The 1-4-U Throw-away Dispenser—Practical, economical. Bracket permits mounting in any location. When dispenser is empty, throw away, and replace. No cleaning, no re-filling, no sanitary problems. Cartons factory-sealed, tamper proof. Dispenses one tablet at a time. Two sizes—500 and 1000 tablet capacity.

The Plastic Model Salt Tablet Dispenser—Capacity of 750 tablets. Can be locked in position to prevent tampering. Sturdily constructed with a translucent upper half permitting a visual check of supply. Case is dust and moisture proof. Easy to refill. One-hand operation delivers single tablet.

Four types of tablets—Impregnated (for slow dissolving); plain salt (sodium chloride); enteric-coated (for delayed dissolving); combination salt and dextrose (for extra energy). Write for details.

and for protection in the field . . .

M-S-A PLASTIC SNAKE BITE KIT

Contains self-suction pump for venom removal, and all necessary material for emergency treatment. Write for details.

TICKS-OFF

A 6-second spray protects against ticks, chiggers, mosquitos, etc. for hours. Non-toxic—safe around food. Write for details.

FOILLE AEROSOL SPRAY

Instant relief of burns, sunburn, lacerations, wounds. Reduces chances of infection; shortens healing time. Write for details.

MSA
SAFETY EQUIPMENT HEADQUARTERS

Call the M-S-A man on your every safety problem . . . his job is to help you

MINE SAFETY APPLIANCES COMPANY

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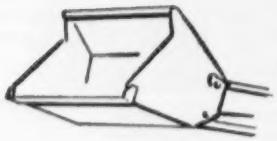
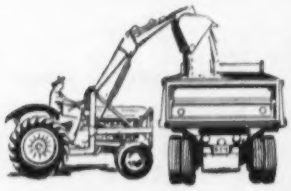
Measure the load, compare the price...see how FORD GIVES YOU MORE!



More Capacity Per Dollar

Ford Tractor-Loader gives you ½-ton load capacity at full lift . . . more than a ton breakaway capacity. Choice of buckets for many jobs.

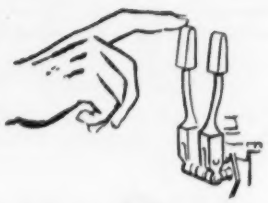


Greater Reach and Lift

Ford Industrial Loader provides 10′ 10″ lift from ground to bucket bottom . . . 26″ reach at full lift. Load entire truck from one side.

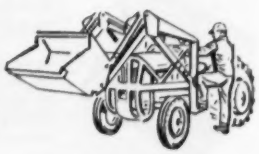
Instant Hydraulic Control

Easy-to-operate levers provide full, instant control of loader and bucket. Tractor hydraulic system is free for use with rear-mounted tools.



Easy, Step-On Design

Ford Loader leaves side of tractor open. Wide, low step-plate enables operator to move quickly, safely and easily into seat, with no climbing.



Find out how a Ford Tractor-Loader can handle your jobs for less. See your Ford Tractor and Equipment dealer, or write to: Tractor and Implement Division, Ford Motor Company, Birmingham, Mich.

Ford
TRACTORS AND INDUSTRIAL EQUIPMENT

You see more **FORDS** *because they save more money!*

GROUNDBREAKING for AGC's headquarters building brings smiles to faces of outgoing president Frank J. Rooney and new president Lester C. Rogers, Bates & Rogers Construction Corp., Chicago. New vice president of AGC is F. W. Heldenfels, Jr., Texas.

At the Annual Convention...

Bidding Errors Worry AGC

AS MIGHT BE EXPECTED, labor relations and the still-rising cost of doing business were prime topics of discussion at the Associated General Contractors' 38th annual convention in Washington last month. But members also spent much time with less mundane matters. The subject that generated the most heat was the claiming of mistakes in bids after they are opened.

In one recent period, the Corps of Engineers alone received a monthly average of four pleadings of bidding errors. And Reclamation Commissioner W. A. Dexheimer protested that "there is still much to be done to improve bidding. Mistakes in bids and bidders taking exception to specification provisions have become an increasing problem in recent years. . . . Bidders themselves are misled by erroneous bid totals indicated at bid openings. Such irregularities and misunderstandings in bidding not only result in delaying award of contract, but cast reflections on the integrity of bidders."

AGC itself was less gracious. A spokesman flayed the "professionals" who seemingly make errors in bids just to expose competitors' prices and recommended that the Comptroller General "remove the possibility of financial gain in the fine art of second guessing." To this end, the convention passed a resolution recommending that:

1. The only relief granted one claiming error in his bid be permission to withdraw the bid.
2. A bidder claiming error be disqualified from bidding again on that particular project.
3. When a claimed error is acknowledged by the owner, the erroneous bid be voided, and action taken on the remaining bids be the same as though the erroneous bid had not been submitted.

Subcontractor Relations

On relations with subcontractors, the association decided not to oppose federal bid-shopping legislation now pending in Congress. The group did, however, resolve to oppose any detrimental changes in the current bills, which now provide that:

1. It is "in the best interests" of the government to use "the single contract system. . . . under which the general contractor is solely responsible for completion and has undivided responsibility therefore and full control and authority to coordinate and complete" building projects.
2. Mechanical subs be named, but lets the general change them

HIGHWAY DIVISION—New chairman W. Ray Rogers (second from right) and vice chairman Manley Osgood (left) flank outgoing chairman E. O. Earl, with manager Jim Sprouse.

HEAVY DIVISION—New chairman is Robert W. Hoover (left) who succeeds William H. De Butts (right). Charles S. Harney was elected vice chairman at Washington convention.

BUILDING DIVISION—Outgoing chairman Earle J. Wheeler stands between his successor, laughing Charles B. Solomon (right), and 1957 vice chairman Ira H. Hardin.

AGC . . . continued

within five days of bid opening; permits changing subs any time they fail to furnish requested performance bond or enter into a contract, or default, or are declared unqualified by the government; and permits change after contract award provided the general contractor accounts to the contracting agency for any resultant cost savings.

3. No permission is required of the federal contracting agency to change or substitute a mechanical subcontractor.
4. No contract or property rights are created by the bill in favor of the sub as against the general contractor or federal government.
5. An exception to the naming requirements is provided when the general has not received a "definite, complete, and responsive bid," and says so.

On the same subject, AGC members heard harsh words from their former president Walter L. Couse. He warned of the increasing complaints from architects and government agencies to the effect that some general contractors "are not fulfilling their responsibilities in coordinating, directing, and checking the work of their subcontractors. If this trend continues, the general system as we advocate it will be in jeopardy, and the danger of separate contracts will become more serious."

Contract Prices

On prices, Commissioner Dexheimer exhorted contractors to avoid "bidding which includes unreasonably high contingencies or margin of profit because work is plentiful. I urge you to sharpen your pencils and figure your bids as tight and close as possible. Otherwise you may kill the goose that lays the golden eggs." Most contractors felt that they had not yet found the eggs, much less the goose.

Job-site thefts and damage to construction machinery and supplies have long plagued contractors. In a move to counteract these losses, AGC recommended legislation to make it a federal offense to destroy or damage equipment on projects incorporating any federal funds. And it called for necessary legislation to impose severe penalties on purchasers of stolen machinery or supplies from such projects.

In California and the World Over

Rock Really Rolls

with Bucyrus-Eries Loading

Granite-heaped hauling units flow steadily from beneath the dipper of this 6-yd. Bucyrus-Erie 150-B shovel—one of two such units being used by Morrison-Walsh-Perini in construction of the Wishon Dam for the Pacific Gas and Electric Company.

This $12-million rock-filled dam will be located on the north fork of the Kings River, 88 miles east of Fresno, California. It will require excavation of 3½ million cubic yards of granite and impervious material.

This long, tough job, scheduled for completion in November, 1958, demands excavators that will maintain consistent, high production month after month. Bucyrus-Eries have the design and manufacturing extras to give that kind of performance in the toughest of digging. Outstanding front-end design, for instance, with tubular dipper handle, provides extraordinary strength without extra weight. Freedom of the handle to rotate in the saddle block eliminates torsional stresses during digging.

The field-proved quality built into Bucyrus-Erie machines makes them the choice of the men who handle the big jobs like this Wishon Dam project. Write for full information on the Bucyrus-Erie 110-B, 150-B or 190-B heavy-duty excavators. 131L57C

GLOBAL APPROVAL
RHODESIA · UNITED STATES · VENEZUELA · ALGERIA · PERU · CANADA · CONGO · ENGLAND · FINLAND · FRANCE · INDO-CHINA · CHILE · AUSTRALIA · SWITZERLAND · NORTH AFRICA · MOROCCO · PHILIPPINES
110-B 4½-cu. yd.
150-B . . 6-cu. yd.
190-B . . 8-cu. yd.
BUCYRUS ERIE

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

ALL NEW 27-YD.
FULLPAK* SCRAPER

WITH NEW BIG B
TOURNAPULL®

advertisement

Pushed by 210 hp C Tournatractor®, the BIG "B" bites into half-frozen, hard-packed clay for a heaped payload. Direct-line thrust from pusher to cutting edge gets big loads fast, easy.

High, curved tailgate on low, wide Fullpak Scraper rolls dirt freely into all corners of the bowl to get maximum payloads. Above view taken from cockpit of Twin-C* pusher. Grill minimizes spillage over tailgate.

TOP money-maker for contractors with big yardages to move in a hurry...

- **New low-and-wide easy loading Fullpak Scraper**
- **Improved prime-mover with modern styling**
- **Choice of 293 hp Cummins or 300 hp GM engines**
- **Loads faster... boils better**
- **Gets low-void payloads**
- **More pay-yards with same pusher power**
- **Puts more profit in big-yardage production**

IF you now have big-yardage contracts under way . . . or plan to tackle large volume work in the near future . . . the new BIG B Tournapull, with new 27-yd. Fullpak Scraper, is the machine you need for bigger production and resulting bigger profits.

The low, wide Fullpak Scraper design has been fully proven for fast and easy loading. It has seen world-wide service for over a year on the modern 18-yd. Model C Tournapull. This companion 27-yd. Fullpak for the big Model B Tournapull, loads just as easy — heaps just as fast — as the smaller 18-yd. Fullpak.

You don't build a new scraper like this overnight! For two years the new BIG "B" has been exposed to rigorous tests in the toughest working conditions. LeTourneau-Westinghouse engineers — who pioneered the 2-wheel, rubber-tired prime-mover, and perfected the electric-control Tournapull-Scraper — brought all their vast experience to bear on the development of the new "B". They have made this new machine easier to handle, easier to service . . . introduced new economies and operational advantages that will earn bigger returns for you on your investment.

— turn page for more on "New B" 'Pull ▶

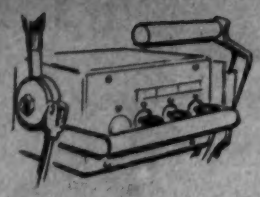
Spreading . . . notice how high-lift apron on B Fullpak clears a big 7'1" opening, and positive-ejection tailgate thrusts forward to wipe bowl clean of stickiest materials. No "stuck-in" yards to carry back.

Coming out of cut, the BIG "B" gains speed rapidly to 28.4 mph. Low, wide bowl permits bigger heap, gives low center of gravity, provides greater stability on any terrain.

*Trademark

— more on "top money-maker"

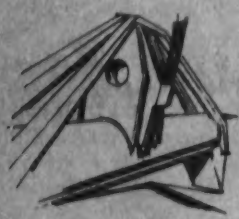
Look at the many advanced engineering improvements incorporated in the new BIG "B". To understand the profit-possibilities of this machine, you should see it in action. No other earthmover can equal it in lowest net-cost-per-yard performance. Make arrangements soon to see the BIG "B" demonstrating its profit-power.



Exclusive Fingertip Electric Control

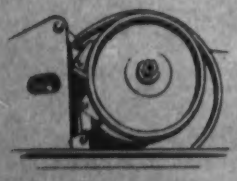
. . . instant, positive action, free of the trouble caused by worn clutches, long cables, sloppy linkage, or leaky hydraulic systems. Control is fast, weatherproof. Generator produces power only when power is needed.

You get ALL these advantages



New Cross Tube

. . . keeps side-sheets in rigid alignment, yet does not restrict frontal opening of bowl.



New Bowl Hoist

. . . single 3/8", 8-part cable is reeved for instant bowl control. Hoist cable drum is larger, increases rope life.

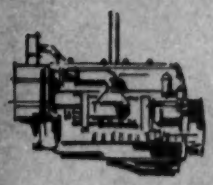
Quick Release

. . . operators can drop the bowl in an instant, or gradually. Cables still spool evenly. Hoist lines remain taut.

New Clutch Brake

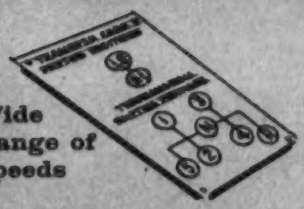
. . . for faster, easier shifting. Double clutching is no longer necessary. Clutch life is prolonged.

advertisement



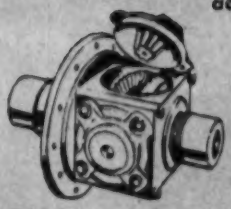
Big Power

...choice of 293 hp or 300 hp diesel, give fast acceleration and bulldog hang-on, reduce gear shifting.



Wide Range of Speeds

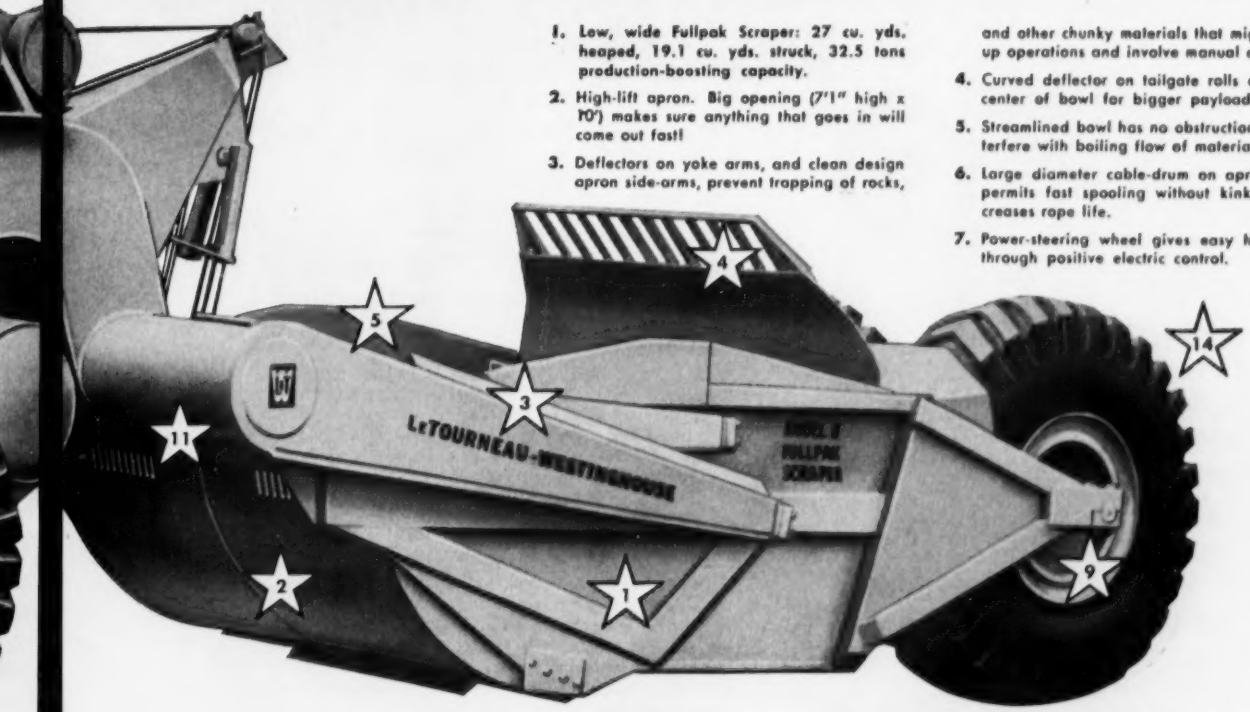
...ten gear ratios, with speeds from 2.6 to 28.4 mph, match working speeds to actual job conditions.



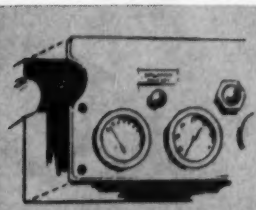
Exclusive Power-Transfer Differential

...automatically diverts power to wheel with best footing, when one wheel starts to slip. Normal differential action on turns is retained.

on new B Tournapull® with low, wide 27-yd. FULLPAK* Scraper



1. Low, wide Fullpak Scraper: 27 cu. yds. heaped, 19.1 cu. yds. struck, 32.5 tons production-boosting capacity.
2. High-lift apron. Big opening (7'1" high x 10') makes sure anything that goes in will come out fast!
3. Deflectors on yoke arms, and clean design apron side-arms, prevent trapping of rocks, and other chunky materials that might slow up operations and involve manual clearing.
4. Curved deflector on tailgate rolls dirt into center of bowl for bigger payload.
5. Streamlined bowl has no obstructions to interfere with boiling flow of material.
6. Large diameter cable-drum on apron-hoist permits fast spooling without kinking, increases rope life.
7. Power-steering wheel gives easy handling through positive electric control.
8. Cockpit is raised to give operator clear visibility. He can see both load and pusher at all times for closer coordination.
9. Scraper wheels are easily removed, and interchangeable with wheels on prime-mover. Outboard bearings give stable load support.
10. Multiple-disc air brakes, and sturdy brake elements, give quick stopping power, longer service, added safety factor.
11. Heavy cross-tube ties side-sheets rigidly together on low, wide Fullpak bowl.
12. Constant voltage transformer provides adequate power for control at low engine RPM.
13. Quick-release clutch and fast electric-hoist allow rapid bowl "pumping".
14. Large push-plate, of all-welded, reinforced box-type construction, provides big pusher target, keeps contact over uneven terrain.



Easier Maintenance

...entire switch panel lifts out easily for service. Rectifiers slide out. Grease fittings are centralized. Transmission and clutch are accessible in minutes. Engine can be serviced readily from sides or bottom. Less cable is used.

Condensed Specifications for New B Tournapull

Capacity: Tons.....32.5
Heaped, cu. yds.....27
Struck, cu. yds.....19.1

Power: Choice of 293 hp Cummins
300 hp GM

Tires (Std.): Four 27 x 33 — 30-ply rating

Speeds: Ten forward 2.6 to 28.4 mph
Two reverse 2.4 to 3.5 mph

Turning Angle: 90° left or right

Width Required for 180° Turn: 39'10"

Control: Fingertip Electric

Brakes: Multiple-disc air brakes with 6552 sq. in. of braking surface

Dimensions:

Length	44'0"
Width	11'9"
Height	12'2"
Wheelbase	26'10"

Shipping Weight (approx. lbs.).....68,900
(Specifications subject to change without notice)

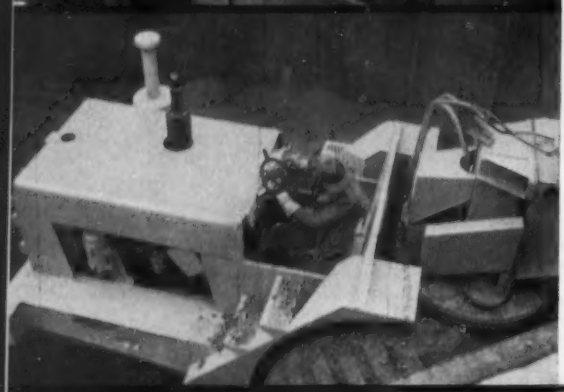
*Trademark

— turn page for more on BIG B 'Pull ▶

— more on "top money-maker"

Low yoke...high seat... gives operator of B Tournapull® clear view of load and pusher

Your B Tournapull operator sits comfortably in the cockpit of this big machine and only turns his head to see blade, load, and pusher operator. There is money-making advantage in this clear-vision design. Your operator is better able to position his machine for faster contact and closer coordination with the pusher. He can see the load, and control the depth of cut for faster loading . . . can easily see signal for a quick break-away the moment his load is heaped and ready for the haul. Clear-vision adds speed!



Seat on new B Tournapull is located at left of center, which enables operator to see blade, load, and pusher merely by turning his head to the left. His left hand is free to handle the steering wheel. His right hand rests comfortably over the electric-control switches. He is always in complete control of his machine, without twisting his body one direction while stretching in the opposite direction to reach hard-to-get-at controls. Your operator works relaxed . . . turns in more production at the end of every work-day.

180° turns in 39'10"

For a big earthmover — of 27-cu. yd. capacity — you can't beat the BIG "B" for effective work in close quarters. Empty or loaded, the scraper can remain stationary while the prime-mover swings right or left to make 90° turns. Operator turns steering wheel, and a powerful electric motor on kingpin housing pivots the prime-mover to the desired direction. With only 2 parts, rotor and stator, this brushless motor applies power simply and efficiently. Motor is unaffected by dust, dirt, moisture, or climatic conditions. The big machine lets you work in restricted areas . . . helps you speed production for bigger profits.

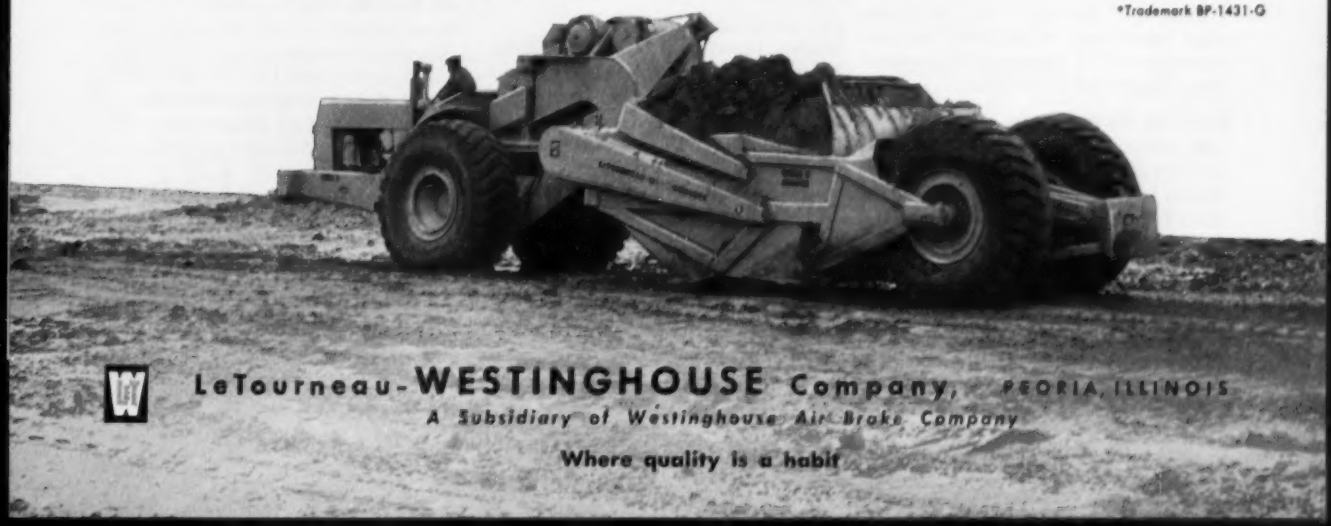
Profitable companion to the new B Tournapull is the big 420 hp LeTourneau-Westinghouse Twin-C* push-tractor. With its 2 big 210 hp motors synchronized for maximum push-power, its 80,400 pound weight, big 29.5 x 29 tires, and speed to 20 mph, you have the push necessary to get capacity 27-cu. yd. loads in less than a minute.

See for yourself why the BIG "B" is your top money-maker for moving big yardages...FAST

When you estimate your next big-yardage project, figure it first on the basis of using your present equipment. Then figure it again with 27-yd. B Tournapulls handling the production hauling. Compare these figures. You will see how the BIG "B's" — with their advantages of bigger capacity and faster movement — haul more yardage in less time. You will see how they can help you beat job-completion dates, make it possible for you to submit winning bids, help you make bigger profits.

Your LeTourneau-Westinghouse Distributor has all the facts and figures necessary for you to use in making comparative estimates. He can give you information, also, concerning price, trades, and deliveries. Since the new B Tournapull is bound to have a place in your equipment spread of the future, it will pay you to write or 'phone now for full information. Plan to order well ahead of required delivery . . . the best equipment for you is best for others, too.

*Trademark BP-1431-G



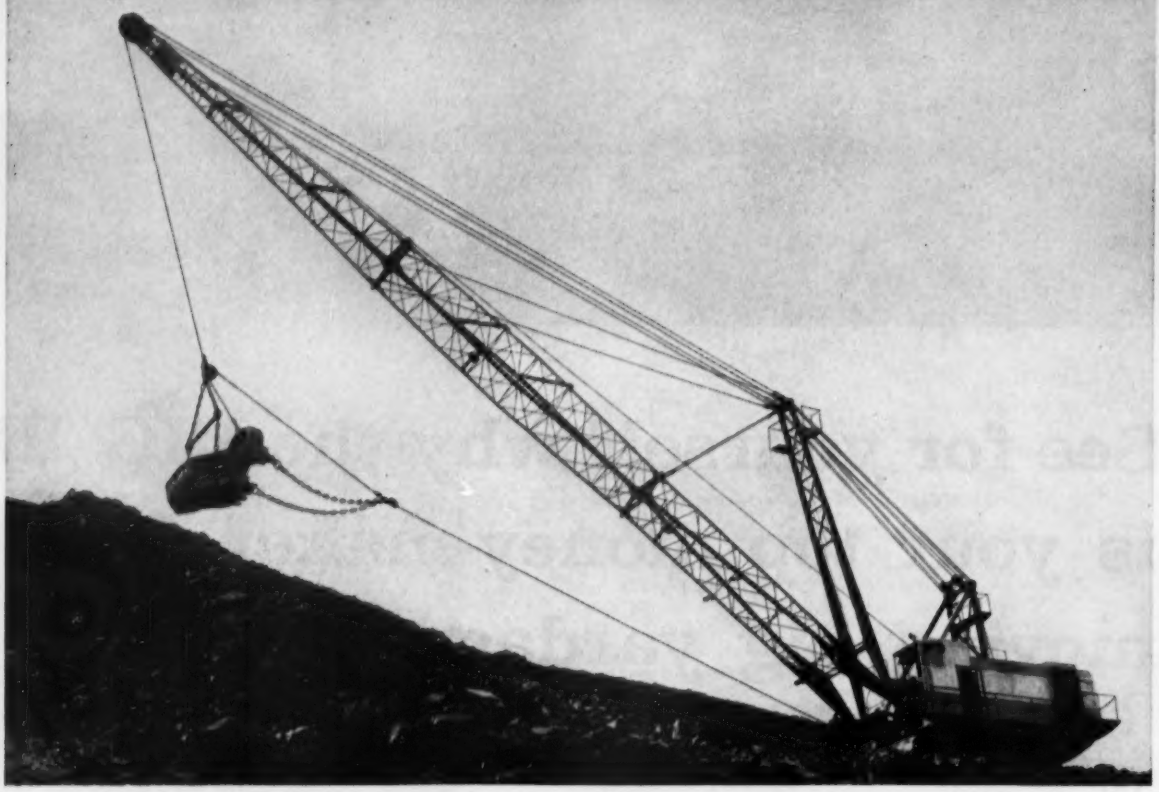
LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

an ACCO product

American Cable TRU-LAY VHS | 15% STRONGER



57% Longer Life with New VHS Dragline

Draglines take a real beating in the coal stripping operations of the C B & M Coal Company, Plains, Pennsylvania. Used for removing over-burden, the best Improved Plow Steel draglines lasted 525 hours. When new TRU-LAY VHS draglines were used they established service records of 825 hours—57% better than Improved Plow Steel.

Entirely New Grade

VHS is setting similar service records on Draglines all over the country. Made from a new grade of steel for wire rope, new VHS is at least 15% stronger than Improved Plow Steel, the strongest grade available before VHS. This means you can handle heavier loads with the same diameter line. And you get a higher factor of safety.

For Scraper Cables, Shovel Hoist Ropes, Winch Lines

New VHS is also tougher . . . resists abrasion . . . cannot become "hide-bound" or lose its flexibility. Developed especially for use as scraper cables, draglines, shovel hoist ropes, and winch lines, it stands up better in these toughest services.

Cuts "Down Time"—Saves Money

In addition to longer life, new VHS cuts costly "down time" of equipment for wire rope replacement. This can mean savings.

At Your Distributor Now

Your American Cable distributor has draglines, scraper cables, shovel hoist ropes, and winch lines of new VHS in stock now. Just call him and tell him the size and length you want. You don't need any complicated specifications.

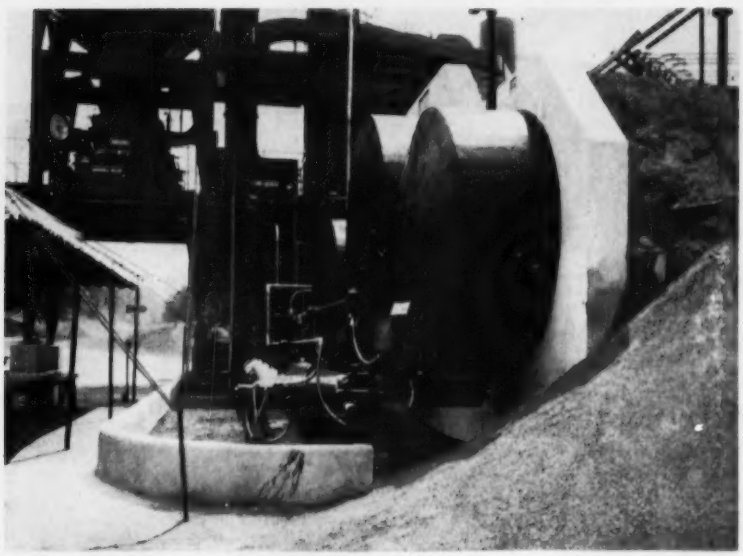
See your American Cable Distributor or write to the nearest American Chain & Cable Company Office

ACCO American Cable Division

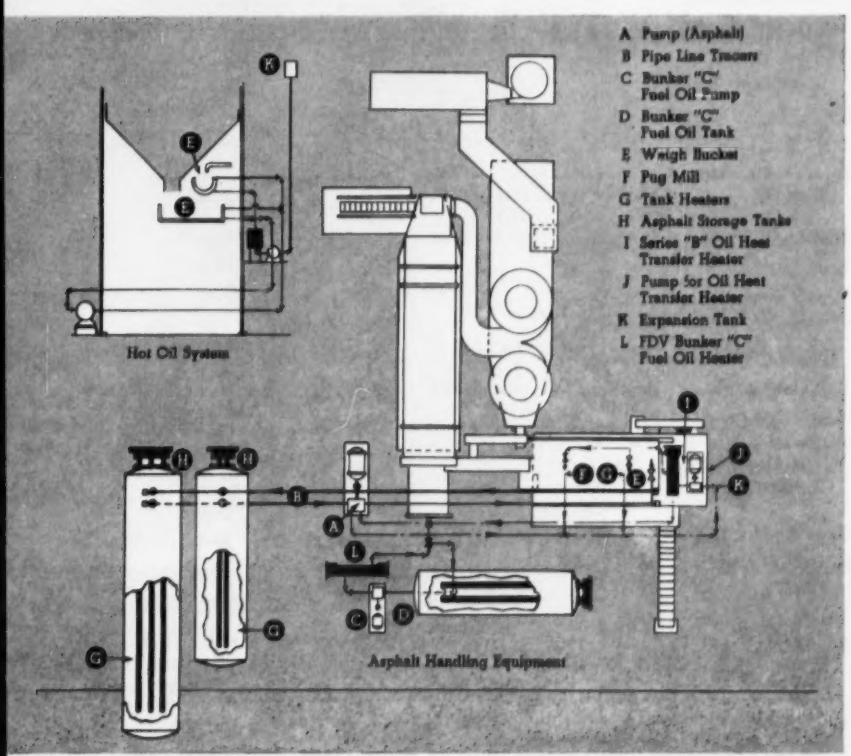
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

How to Heat An Asphalt Plant Electrically



ASPHALT STORAGE TANKS adjacent to plant are heated by internal electric tubes. Heating at night during off peak hours can cut electric costs.


A Pump (Asphalt)
B Pipe Line Tracers
C Bunker "C" Fuel Oil Pump
D Bunker "C" Fuel Oil Tank
E Weigh Bucket
F Pug Mill
G Tank Heaters
H Asphalt Storage Tanks
I Series "B" Oil Heat Transfer Heater
J Pump for Oil Heat Transfer Heater
K Expansion Tank
L FDV Bunker "C" Fuel Oil Heater
Hot Oil System
Asphalt Handling Equipment

COMBINATION electric and hot-oil heating system features electric heating of pipelines and tanks and electrically heated hot oil for metering devices.

ELECTRIC HEATING of asphalt plants offer many obvious advantages. It is simple, safe, clean, automatic, fireproof, and explosion proof. It requires little maintenance, cuts labor cost, and prevents overheating with its resultant coking.

But the big question is cost. Does it cost less to operate than conventional steam and direct-fired systems? Or is the price unreasonable? According to Hynes Electric Heating Division, there is a substantial saving, and to prove their claim, they studied two 2-ton asphalt plants in New Jersey.

Hynes installed meters on a McCarter 2-ton plant owned by Edison Asphalt Co., Edison Township, and a Standard 2-ton plant operated by N. J. Asphalt Co. of Jersey City.

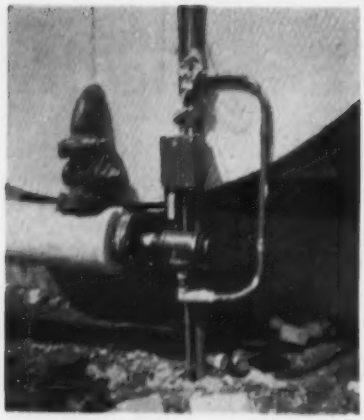
Both plants are heated by a combination electric and hot-oil system. Internal tubular electric heaters handle fuel and asphalt storage tanks, internal tracers heat pipelines, and an electrically heated hot-oil transfer system takes care of metering devices, weigh bucket, and pugmill.

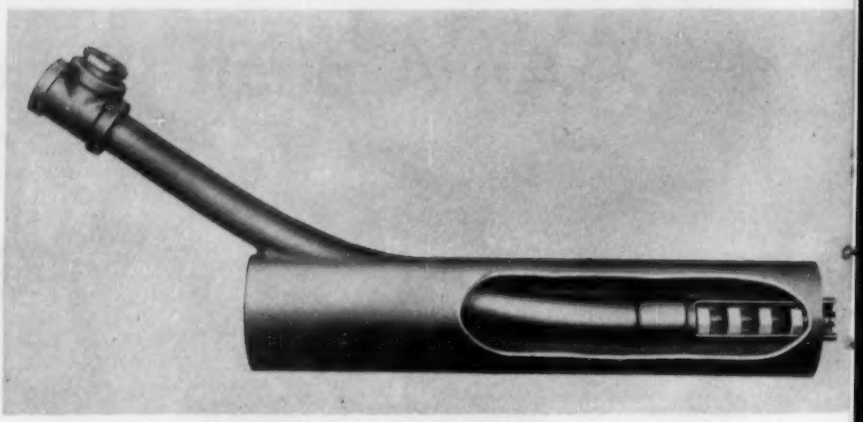
On storage tanks, tubular heaters run the full length of the tank. Attached to the tank wall by adaptor boxes, they lie in a horizontal position at the bottom of the tank. Heaters supply only enough heat to keep asphalt at the proper temperature. There is no overheating. Often, it is most economical to heat tanks only at night, on off-peak hours. Insulation retains sufficient heat during the day to allow the tanks to drift.

Pipeline Heating

A popular method of heating typical 4-in. pipelines is by internal tracer. Inside each 4-in. pipe is a 2-in. tube centered by fins. Within the tube is a flexible electric heating element. Asphalt travels between the tube and the pipe, and the outside pipe is covered with insulation.

Prime advantage of this arrangement is that all heat goes directly to the asphalt. Also, the heating tubes can be removed easily through terminal boxes without





PIPELINE TRACING consists of electrical element in small tube centered inside pipe. All heat goes directly to asphalt. Flexible electric heating element slides into tracer pipes through waterproof terminal boxes. It is easily removed.

ELECTRIC HEATING . . .
continued

drawing or disconnecting the lines.

An electrically heated hot-oil system consists of a hot-oil circulating pump, a multi-pass tubular heater, and an expansion tank. Smooth, even heat is supplied at controlled temperatures to all vital parts of the plant.

Cost Study

Cost of electric power for operating the two New Jersey plants is based on a demand charge plus an energy charge. Demand is based on the maximum number of kw drawn during any 15-min period of the billing month. Energy charge decreases in accordance with total kw consumption. So, if demand can be kept low, the total cost of electricity will be less.

For a typical 2-ton plant, the motor load in kw is often about twice the total heating load. Thus the motor load during the day's operation will set the demand load. A typical New Jersey rate schedule is shown in **Table 1.**

Storage Tank

A three-day cost study of a 10,000-gal asphalt storage tank at Edison Asphalt Co. was made during July when the ambient temperature was 73 deg. The tank is 8 ft in dia, 26 ft long, and covered with 4 in. of Foamglass insulation to maintain a temperature of 300 deg.

During the study period, the company turned off the heaters

continued on page 108

TABLE 1

DEMAND CHARGE			
First 50 kw of monthly demand or less		$100.00	
Next 50 kw of monthly demand	at	1.65	per kw
Next 500 kw of monthly demand	at	1.45	per kw
ENERGY CHARGE*			
First 5,000 kwhr	at	0.03	per kwhr
Next 45,000 kwhr	at	0.01	per kwhr
Next 200,000 kwhr	at	0.009	per kwhr
Next 250,000 kwhr	at	0.008	per kwhr
Next 300,000 kwhr	at	0.006	per kwhr
Over 800,000 kwhr	at	0.005	per kwhr

* Charges subject to fuel adjustment costs. Values given are basic rates.

TABLE 2

Date	Time Power is on	Average kw	Kwhr	Cost at .01/kwhr
July 16	8.87 hr	20.8	184.5	$1.85
July 17	9.00 hr	20.8	187.2	1.87
July 18	6.50 hr	20.8	135.3	1.35
			Total	$5.07
			Average cost/day	$1.69

TABLE 3

Date	Time Power is on	Average kw	Kwhr	Cost at .01/kwhr
October 10	4 hr	25	100	$1.00
October 11	3¼ hr	20	65	0.65
October 12	3 hr	21.6	64.8	0.65
			Total	$2.30
			Average cost/day	$0.77

TABLE 4

Equipment	Night Heating with No Increase in Demand Cost/Day	Heating with Increased Demand
2- 10,000 gal tanks	$3.38	$5.58
1- 30 kw hot-oil heat transfer system	0.80	2.20
50- Pipe line tracing-approximately 20 Kwhr/day	0.20	0.20
Total	$4.38	$7.98

Look at This Brand New Construction Tool!

THE LORAIN SP-107

7-TON CRANE . . .
3/8-YD. SHOVEL-DRAGLINE
CLAMSHELL-HOE
will do things no other machine can do!

SQUARE DESIGN—NO OUTRIGGERS . . . The "SP-107" Carrier is 8 ft. wide with 8 ft. wheelbase. With this close-coupled "square" design, you get *full rated* lifting or digging capacity in every turntable position throughout the 360° swing. With no time-consuming outriggers to set or unset, you get maximum capacity with instant mobility.

TORQUE CONVERTER . . . Gives you automatic adjustment of engine torque to match machine, travel and load conditions. Also provides "throttle control" for precise control of load lowering.

OFF-THE-HIGHWAY SERVICE . . . Powerful 4-wheel drive provides maximum tractive effort for rough terrain . . . big tubeless tires give plenty of flotation for soft ground travel . . . which means the "SP-107" will go most places a crawler will go.

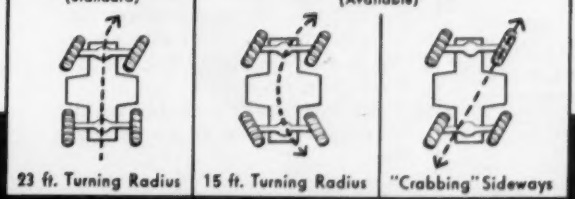
15 M.P.H. MOBILITY . . . You get 3 or 6 travel speeds up to 15 m.p.h. through a smooth, automatic transmission. The "SP-107" is an agile, fast-stepping Self-Propelled Crane that does not need a trailer to move from job to job.

INDEPENDENT TRAVEL . . . This standard feature makes it possible to (1) travel, (2) hoist, (3) swing, and (4) derrick the boom—separately, in any combination, or all at the same time, with each operation controlled by an independent hydraulic clutch. Gives you greater maneuverability and flexibility of operation.

4-WHEEL STEERING . . . For the utmost in maneuverability and shortest turning radii, two-axle steering is available (see diagram). Front and rear axles steer independently of one another, permit maneuvering and working in closer quarters, permit "crabbing" sideways to "snuggle-up" to loads.

Your Thew-Lorain Distributor has the "SP-107" story.

NO OTHER MACHINE CAN MANEUVER LIKE THIS



THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

. . . for low-cost land clearing

MORE PRODUCTION FROM BOTH ENDS AND THE MIDDLE

Pictured here are 3 Fleco specialized land clearing products designed to get more production from *both* ends of your tractor *and* your operator, too – Pull Stumper, Root Rake and ST Cab Guard.

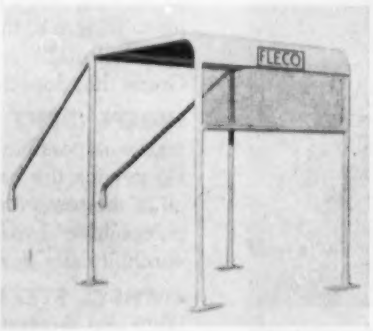
With the Fleco Pull Stumper you drop the massive cast steel, hard-surfaced tooth over a stump or root, pour on the power and out pops the stump. Or you can cut deep on all sides of a tree, cutting through lateral roots, then spin your tractor around and push out stumps or trees with a front-mounted Fleco Rake.

Illustrated at the lower left is a Fleco Root Rake. Rake pushes out trees, stumps and roots, rakes roots from the soil, moves a big load, shaking it free from dirt, and stacks the material in dirt-free piles.

At the lower right is a Fleco ST Cab Guard – designed to keep your operator safer, more productive.

See your Fleco-Caterpillar dealer for complete details on the full line of Fleco Land Clearing Products.

Fleco Root Rake and Top Guards.



Fleco ST Cab Guard. Heavier HD Cab Guard available.

FLECO CORPORATION

Jacksonville, Florida

ROCK, ROOT & BRUSH RAKES
TREE CUTTERS • UNDERCUTTERS
CAB GUARDS • ROOT CUTTERS
DETACHABLE & PULL STUMPERS
TREEDOZERS • ROLLING CHOPPERS
HEAVY-DUTY TOOL BARS

DECADE OF MANUFACTURING 1947 FLECO 1957 LAND CLEARING EQUIPMENT

ELECTRIC HEATING . . .
continued

from about 8 am to 4:30 pm in order not to increase their demand during the period when the plant motor load was highest. The temperature drop of the asphalt in storage during the day's operation was only about 20 deg.

Figures in **Table 2** give an average cost of $1.69 per day. To compute the estimated increase in cost if the tank was heated during full motor load, we multiply the daily load of 20.8 kw by $1.45 (see rate schedule) or $30.20 per month, an additional $1.00 per day. Thus, heating a 10,000-gal tank under the most adverse economic conditions would be $1.69 plus $1.00, or only about $2.70 a day.

Transfer System

Costs of operating a hot-oil heat transfer system were made at the plant of N. J. Asphalt Co. during October. The mean ambient temperature was 51 deg.

During the three-day period, the equipment did not draw power during the time the plant was in operation because the hot asphalt was sufficient to maintain the temperature of the jacketed equipment. **Table 3** shows that the average cost per day was $0.77.

The third heating cost is pipeline tracing. With the heaters rated at 50 watts per ft, or a total of 2.5 kw for 8 hr, the cost would be about $0.20.

Adding the costs for heating storage tanks, pipelines, and hot-oil transfer system, we get two costs for heating a 2-ton plant—one for partial heating and the other for full heating during the day. Heating while the plant is operating cost $7.98 per day and heating at night was $4.38. **See Table 4.**

Efficiency

One of the chief reasons for the efficiency of electric heating is that all energy is applied directly where it is needed. None is lost through waste flue gas, steam condensate, or soot.

Electric heating systems for hot mix plants are virtually maintenance-free and are entirely automatic in operation. Use of a steam plant to provide heat requires that someone put the plant into operation some time before the hot mix is actually required.

The future will probably see the development of an all electric system.

TEMPERED AND BRINELL TESTED to exactly the right degree of abrasion-resistant hardness.

ArcEdge

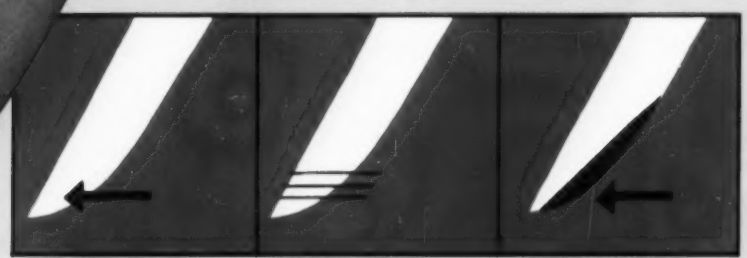
12M CAST SCRAPER CUTTING EDGES

TOUGH...TEMPERED TESTED and TERRIFIC!

ESCO Cast 12M Scraper Cutting Edges last longer under every digging condition. Because of the high-strength, wear-resistance and shock-absorbing toughness, *ESCO* 12M increases cutting edge life, reduces down-time and keeps your equipment operating far more profitably on every job.

ESCO Cast 12M Scraper Cutting Edges are *Oven-Tempered*—that's why the same tough "edge-metal" extends all the way through; not just a thin shell of hard surface metal that soon wears away. *ESCO* Cast 12M Scraper Cutting Edges will actually outwear ordinary rolled steel blades 5 to 1, and *stop* blade breakage.

ESCO Cast 12M Scraper Cutting Edges are Brinell Tested to assure you exactly the right combination of wear and shock resistance for longer blade life, fewer blade changes and more profit per job.



STARTS SHARP

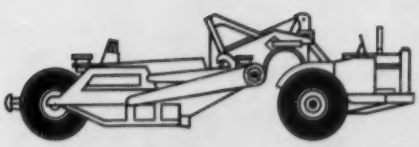
ESCO ArcEdge 12M Scraper Cutting Edges are *cast sharp*. They are sharp the day you get them—no wearing in period. Pre-sharpened edges reduce wear and tear on the scraper and pusher.

STAYS SHARP

ESCO 12M ArcEdge Scraper Cutting Edges *stay sharp* as they wear. Edges do not wear "bullnosed," but retain their sharpness for the life of the cutting edge.

LASTS LONGER

ESCO 12M ArcEdge Scraper Cutting Edges give you tough extra metal where you need it, *behind the edge*—to slow down excessive wear. And ESCO 12M ArcEdge Scraper Cutting Edges are reversible—there are two long-lasting cutting surfaces on every *ESCO* Scraper Cutting Edge.



ESCO®

ELECTRIC STEEL FOUNDRY COMPANY

2149 N. W. 25TH AVE. • PORTLAND 10, OREGON

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.

Offices in Most Principal Cities

ESCO INTERNATIONAL, NEW YORK, N. Y.

IN CANADA ESCO LIMITED

DIPPERS

For any stick connection. General purpose, Heavy Duty, Coal Loader, Mosabi Type—to your specifications, your job requirements.

DRAGLINES

Featherweight, Medium Weight, Heavy Duty Standard, Heavy Duty Mining and Tapered Dragline Buckets for any excavating or loading job.

ORANGE PEELS

Full leaf, semi-leaf, and digging leaf, three point grip for fast, efficient handling of rip-rap, boulders, stumps, logs and scrap.

HOES

FASTBACK® design eliminates drag and heeling action in trenching and back filling jobs. Sixteen basic lip widths. Cutting widths from 20" to 62". Digs equally well with or without sidecutters.

NO DIGGING PROBLEM TOO TOUGH FOR ESCO® BUCKET SPECIALISTS

CLAMSHELLS

For all-purpose digging and materials rehandling. Two through six part reeving permits wide range of closing power and speeds. Equipped with ESCO Two-Piece Teeth for faster handling of compacted materials.

Draglines, dippers, hoes, clams, orange peels – *ESCO* builds them *all* to handle your toughest digging requirements. Drawing upon years of design and fabrication experience, *ESCO* engineers can build a bucket for *your* job that will:

INCREASE YARDAGE: *ESCO* buckets are job-tailored . . . to solve your specific digging problems.

CUT COSTS: Critical wear points are alloy steel castings. High strength-weight ratios are achieved through all-welded construction. *ESCO* buckets are available with *ESCO* quick-change two-piece teeth. Seven different point shapes for faster digging.

See your nearest ESCO dealer or write direct

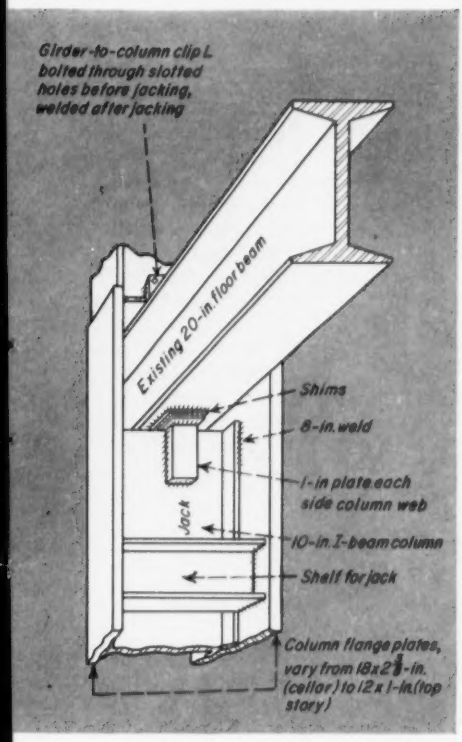
ELECTRIC STEEL FOUNDRY CO.

Manufacturing Plants
2149 N. W. 25th Ave., Portland 10, Ore.
1017 Griggs Street, Danville, Illinois

ESCO International
New York Office
at 420 Lexington Ave., New York City, or
Portland Manufacturing Plant

Other Offices and Warehouses:
Los Angeles,
San Francisco, California
Seattle, Spokane, Washington
Houston, Texas
Eugene, Oregon
Salt Lake City, Utah
Denver, Colorado
Honolulu, Hawaii

In Canada, ESCO Limited


Girder-to-column clip L bolted through slotted holes before jacking, welded after jacking
Existing 20-in. floor beam
Shims
8-in. weld
1-in plate each side column web
Jack
10-in. I-beam column
Shelf for jack
Column flange plates, vary from 18x2 1/2-in. (cellar) to 12x1-in. (top story)

I-BEAM COLUMN is placed in sections to connect floor beam to floor beam.

HYDRAULIC JACK rests on steel shelf welded between load-bearing plates attached to column. Lifting head comes up under existing beam. All floors are jacked simultaneously.

New Column Bolsters Old Building

BUILDING a new column inside an old 24-story structure is tough if the job has to be done while business inside the building goes on "as usual."

There's a risk of unequal stresses occurring during jacking that might crack partitions and cause other safety hazards. Hegeman-Harris, New York contractor, had those headaches to solve when it landed a contract to install new air conditioning equipment and elevators in the 24-story American Surety Building in downtown New York City.

Putting the equipment into the building clearly would overload existing beams and columns. A new column would have to be added to the structure to take the extra load.

Hegeman-Harris engineers got together with its subcontractor, Underpinning & Foundation Co., and decided to build the column in the center of the building in sections. Each section was to run from the top of one floor beam to the underside of the one on the floor above. This would be done floor by floor to the roof.

Jacks then would be placed at each connection and, instead of transferring loads from the beam to the column section by individual floors, all 24 floors would be jacked simultaneously.

"This," said Sid Gilbert, Underpinning's vice president, "would avoid an uneven lift and prevent cracking of partitions—we sure hoped!"

Foundation Comes First

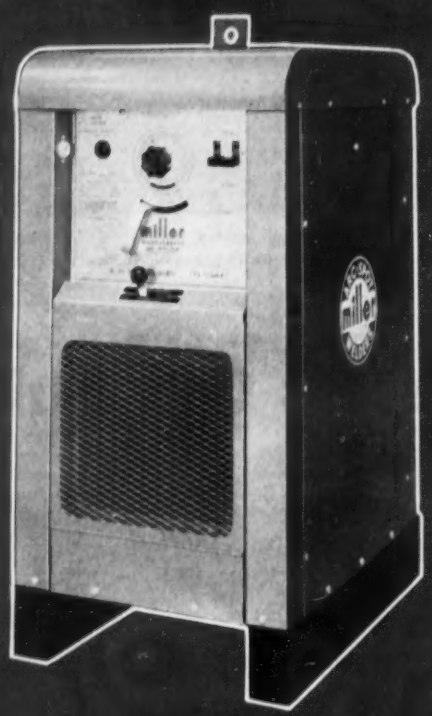
First phase of the job called for building a foundation for the column in the building's second subbasement. This consisted of driving 13 open-end steel piles to bearing with a unique, collapsible pile driver (CM&E, Sept., 1956, p. 155). Piles then were filled with concrete and topped with a concrete pile cap.

Underpinning workmen began building up a series of column sections with 10-in. I-beams. Steel

TAPE dropped from top of building measures compression of new column during jacking.

JACKS from the first to the twelfth floor are controlled individually. From the twelfth floor up, the jacks are controlled in congress by a single, hand-operated pump.

"...if it's Miller you know it's the finest..."



Wherever industry exploits the greater profit possibilities of arc welding processes, Miller selenium rectifier type dc welders have earned re-order respect.

Adapted by design to widest range of specialized and automatic applications, the Miller SR series is offered in single or duplex models of from 200 to 1200 amperes with 60% duty cycle ratings. Lowboy units (27½" high) for stacking.

miller ELECTRIC MANUFACTURING CO., INC.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD. Montreal

NEW COLUMN...
continued

plate varying in thickness from 2⅜-in. to 1-in. were welded the length of the column section to each of the two column flanges. Purpose of the steel plates was to carry the transferred load down to the column foundation. The I-beam was to hold and support the floor beam after the load was transferred.

About 18 in. below each floor beam, a section of I-beam was welded between steel plates to serve as a shelf against which jacks could react during the jacking operation. The lifting head of the jack ran up to the bottom flange of the beam being relieved of its load. Jacks for all floors were operated simultaneously.

Those from the first to twelfth floor were controlled individually. From the twelfth floor up, jacks were controlled in congress by a single hand pump. Elgood Hydraulics System designed the jacking method.

The Lift Begins

When time for the lift came, Underpinning's superintendent, Alexander Lyle, sent signals up the floors to workmen stationed at each connection to begin the jacking. Each jack was given an initial 5-ton load.

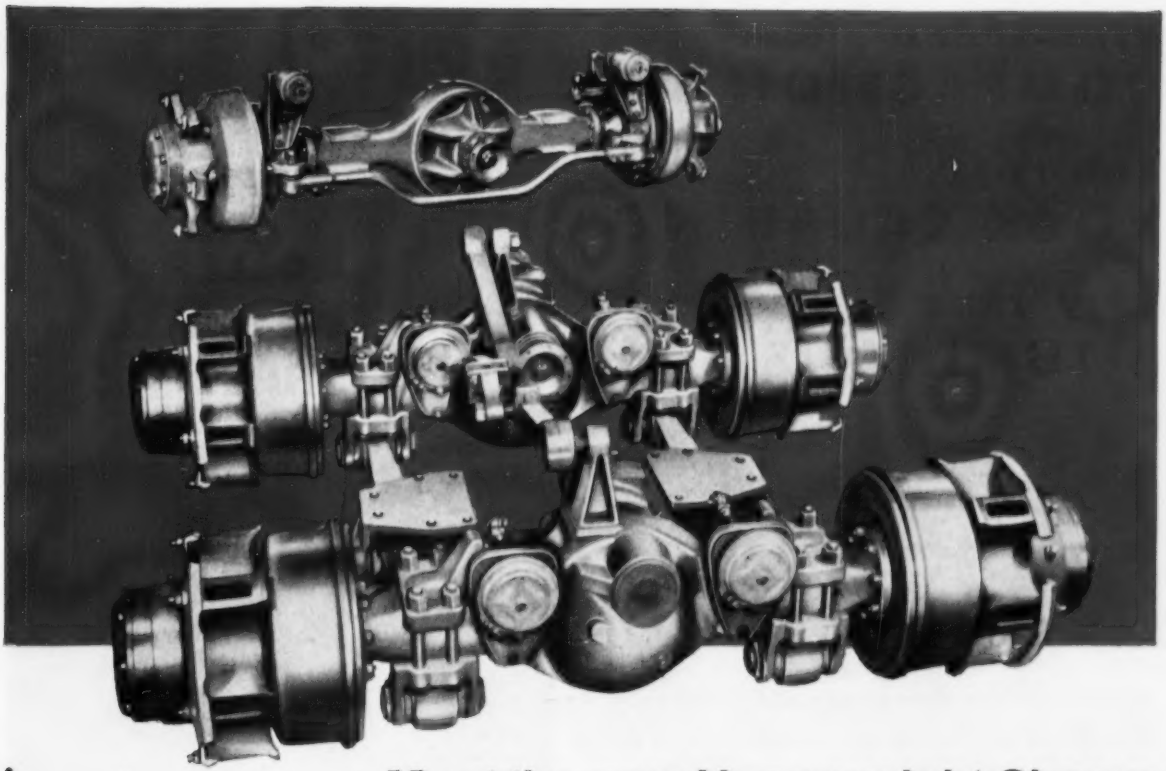
As loads transferred from floor beams through jacks to the columns, workmen wedged spaces between column section tops and beams with steel shims. Additional loads then were applied in 5-ton increments with an hour's time lapse between increments.

This time was spent measuring column compression. Readings were taken in the course of the jacking by tape measure. Total compression in column length top to bottom was 1⅜ in. Total load exerted by each jack was 25 tons.

Jacking began at 5 pm and finished about midnight. The final step before the removal of the jacks was to weld shims in place. Jacks then were removed, and the column was completed.

Said Gilbert: "The operation was a success. There was no cracking of partitions or damage to attached materials."

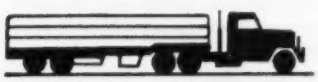
Structural engineers on the job were Strobel & Salzman; architect, Guy B. Panero; consultants, Moran, Proctor, Meuser & Rutledge. White Plains Iron Works did the steel erection.



Meet the new Heavyweight Champ

CLARK Tandem Drive

for 4 x 6 and 6 x 6 units with TWO PLANETARY AXLES



For greater strength and reduced weight—for minimum wear and maximum life—for virtual *elimination* of broken axle shafts and costly down-time—

- **You've never seen the equal of Clark's new Tandem Drive with two planetary axles**

  See how this revolutionary design slashes costs, swells profits

- **70% torque reduction on shafts**—Final reduction by means of the planetary drive in the wheels eliminates torsional wind-up in the shafts—practically puts an end to the common broken-shaft nuisance.

- **Smaller size, increased strength**—substantial reduction in size of shafts and other components with no sacrifice of structural strength—less weight, longer life because of lower torque load.

Take this simple step toward a long and profitable friendship—*send the coupon for full information.*

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY • AXLE DIVISION, Buchanan 6, Mich.
Please send illustrated bulletin on the Clark Planetary Axle.

NAME_____ POSITION_____

FIRM_____ ADDRESS_____

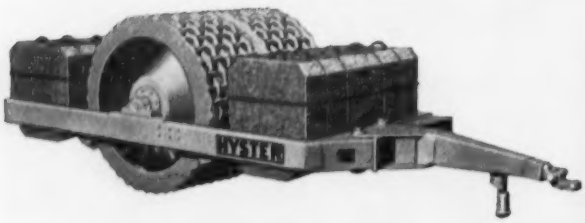
CITY_____ STATE_____

HIGH-SPEED
COMPACTION

LOW-COST
ROCK CRUSHING

EFFICIENT
BITUMINOUS SALVAGE

THE HYSTER "GRID" ROLLER DOES ALL THREE!



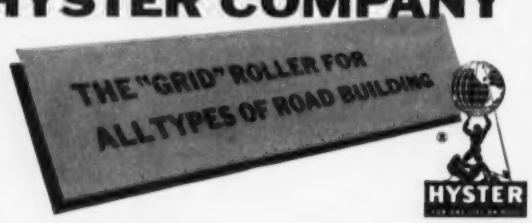
Here is the machine road builders all over the world are using on all types of road construction — free-ways, secondary roads, farm-to-market roads, access and logging roads.

Built for long life on any job—rock surfacing haul roads or high-speed compaction on expressways—the "Grid" roller is designed to give you low cost operation and maintenance. Its high capacity tapered roller bearings give long life. Its high-strength cast steel wheels resist wear in rock and abrasive materials. The heavy-duty frame prevents distortion in the toughest going.

"Grid" is the registered trademark for the Hyster open-surfaced roller. Caterpillar is the registered trademark of the Caterpillar Tractor Co.

For full details, call your Caterpillar-Hyster Dealer.

HYSTER COMPANY

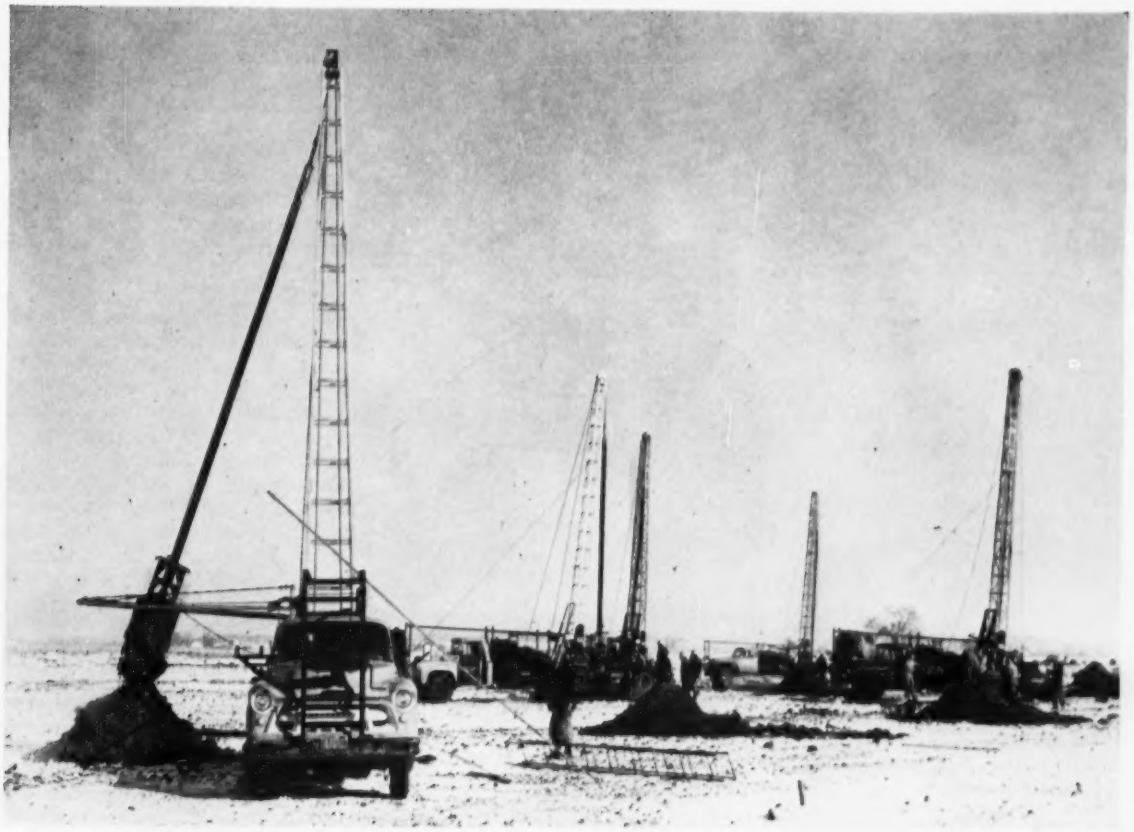


2921 N. E. Clackamas Street.....Portland 8, Oregon
1821 N. Adams Street.....Peoria 1, Illinois
Portland, Oregon • Peoria, Illinois • Nijmegen, The Netherlands

1 **EMBANKMENT COMPACTION**—High-speed rolling (up to 15 MPH towed by Caterpillar DW15 Tractor) matches compaction with yardage of high-speed earth movers.

2 **ROCK CRUSHING**—Pit-run rock quickly and efficiently crushed for base and surface courses on secondary road construction and repair.

3 **BITUMINOUS SALVAGE**—Quickly breaking down old ripped-up mat, the "Grid" Roller salvages all of the original aggregate and reusable binder for use in new surface.



HIGHLY MOBILE truck-mounted Calweld drills work near each other to dig holes for drilled-in-place caisson foundation for the Caterpillar Tractor Co. warehouse at Morton, Ill. Job required the digging of 860 holes for the building's foundation.

Earth Borers Dig Caisson Holes

ROTARY EARTH BORERS did a fast, efficient job of digging 860 holes for the drilled-in place caissons that support the Caterpillar Tractor Co.'s new parts warehouse at Morton, Ill.

The decision to rest the building on drilled-in-place caissons was dictated by a number of factors. The huge warehouse will enclose 20 acres of floor space, and its floor and foundations must carry a heavy weight of machinery. But soil at the site has low bearing capacity, and borings showed ground water close to the surface.

Drilled-in-place caissons permit the heavy warehouse to rest on a strata of 6,000-psf bearing clay about 20 ft below the surface that would have been expensive to reach by other methods. Conventional spread footings would have been slower to construct and might have cost three times as much.

continued on next page

HELPER on one of the earth-boring drills works in the mud to place one of the jacks that will level machine and insure the digging of a perfectly plumb caisson hole.

POWER BUCKET PULLER leads out from the side of one of the drills towards an excavation spoil pile where the excavated material is dumped. This spoil pile later is removed.

OPERATOR and helper on one of Caisson Corp.'s earth-boring machines pick up a belling bucket to under ream a cone-shaped section at the foot of one of the drilled holes.

A joint venture of Caissons Corp. of Skokie, Ill., and George F. Casey Co. of Los Angeles handled the drilling work. First the site was stripped of topsoil by C. A. Powley Co., prime contractor for the grading and foundation work. Then, 1 to 3 ft of compacted fill was built up over the site.

Drilling Begins

Caisson drilling pierced the compacted fill and went down through seams of yellow clay and soft, silty sand to the bearing clay. Average diameter of the shafts is 24 in., and belled footings range from 2 ft 6 in. to 5 ft 9 in. in dia. There also are 10 shafts 3 ft in dia without belled bottoms. All caissons are reinforced with steel. They are arranged in rows to carry the heavy reinforced concrete grade beams which lie underneath the floor structure.

The drilling was a fast-moving operation. Six earth boring drills, manufactured by Calweld, Inc., of Los Angeles, Calif., were moved into the job. All machines were mounted on conventional Chevrolet trucks. Drilling buckets and belling buckets were furnished with each rig.

Caisson Corp.'s machines were on the job in a matter of hours after the drilling arrangement was made, and Casey's machines took only a few days to move under their own power from Los Angeles to Illinois.

The six machines installed 74 completed units in one day. They drilled 641 holes in only 14 days. The holes were filled with concrete and reinforcing steel to complete each one as rapidly as it was drilled.

Ground Water

Prompt completion of the drilled caissons was highly important. In many areas, the ground was so saturated with water only a few feet below the surface that steel casing had to be used to seal off the inflow of water and to reduce caving in any excessively sandy streaks. Approximately 25% of the drilled holes had to be protected by this method.

Usual drilling procedure was to spot the rigs precisely over location hubs set by field surveyors. The rigs then were leveled up on their jacks, and the rotary buckets bit quickly into the earth. Bucket loads of material were hoisted to the surface and pulled out to a

Bucket teeth and ripper available at extra cost.

TEETH AT BOTH ENDS* BOOST PROFIT!

Production really steps up when this working team moves in—the Allis-Chalmers HD-6G tractor shovel with replaceable bucket teeth and rear-mounted ripper. Here's a job-proved combination engineered by the company that pioneered modern tractor shovels for the construction industry.

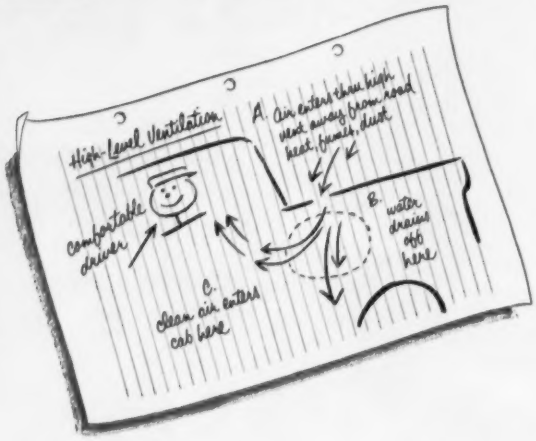
When the hydraulically controlled ripper bites in, even hard blacktop has to give. With the help of teeth at the front end, too, tough material is loosened and broken up for fast, easy loading—a full bucket every time.

You get more work done in less time because the heavy-duty HD-6G is designed for tough jobs. With 72 net engine hp and six-truck-wheel stability, it offers performance that means efficient production, bigger profits for every hour on the job.

These important advantages are also available on bigger Allis-Chalmers tractor shovels—the 2½-yd HD-11G, the 3-yd HD-16G, and the 4-yd HD-21G . . . to help you meet the needs of your tractor shovel jobs profitably. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

in a Chevy cab, even the air is better!


High-Level Ventilation
A. Air enters thru high vent away from road heat, fumes, dust
comfortable driver
B. water drains off here
C. clean air enters cab here

...more evidence that Chevrolet Task•Force Trucks are engineered better and built better for bigger savings!

These cab features give you extra comfort and safety behind the wheel, extra savings on truck maintenance. And they're proof that the most modern trucks for your money are Chevrolets!

The drawing "doodled" above shows how Chevy's High-Level ventilation provides a *comfortable* interior . . . and the numbers in the big picture point out other advantages equally as good to have around you when you haul! They include:

1 *A roof that's specially built for safer, more comfortable hauling.* Sturdy all-steel construction adds to safety; roof's unique inner reinforcement insulates the overhead against heat.

2 *A gleaming, durable baked enamel outside finish.* Here's the reason your Chevy's exterior will resist wear better, look like new longer! This handsome finish is available in a wide variety of colors.

3 *A Nu-Flex seat that beats the bumps!* Deep-comfort coil springs, metered air shock damping and 3-way adjustment let you take it easy on tough jobs!

4 *A cab that's rustproofed to last!* Doors and similar surfaces are rustproofed on the inside as well as on the outside by immersion.

5 *Concealed Safety Steps for convenience.* Inside each cab door, they give you firmer footing, make entering or leaving the cab easier and safer.

6 *An undercoated floor, cowl side panels and fender flanges.* Virtually all exposed surfaces on the underside of the cab are protected by an anti-rust coating.

7 *A non-glare instrument panel to make driving safer!* The textured finish on upper portion of Chevy's instrument panel reduces blinding sun reflections, minimizes eyestrain.

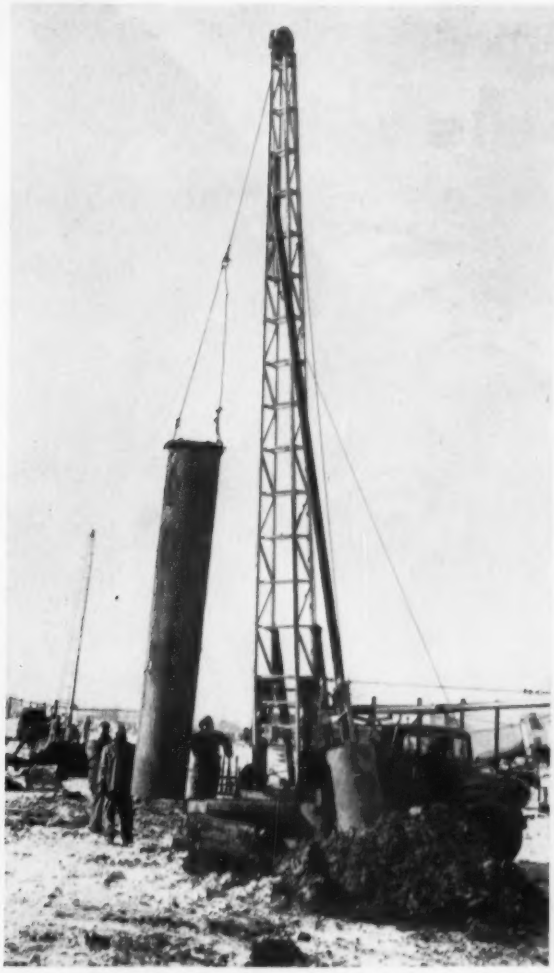
8 *A reliable 2-speed electric windshield wiper* on each side.* Powered by electricity, their action remains *constant* under all conditions.

Such advantages as these (we've shown only a few) combine to make *everything* better in a 1957 Chevrolet truck! You'll see for yourself when you visit your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

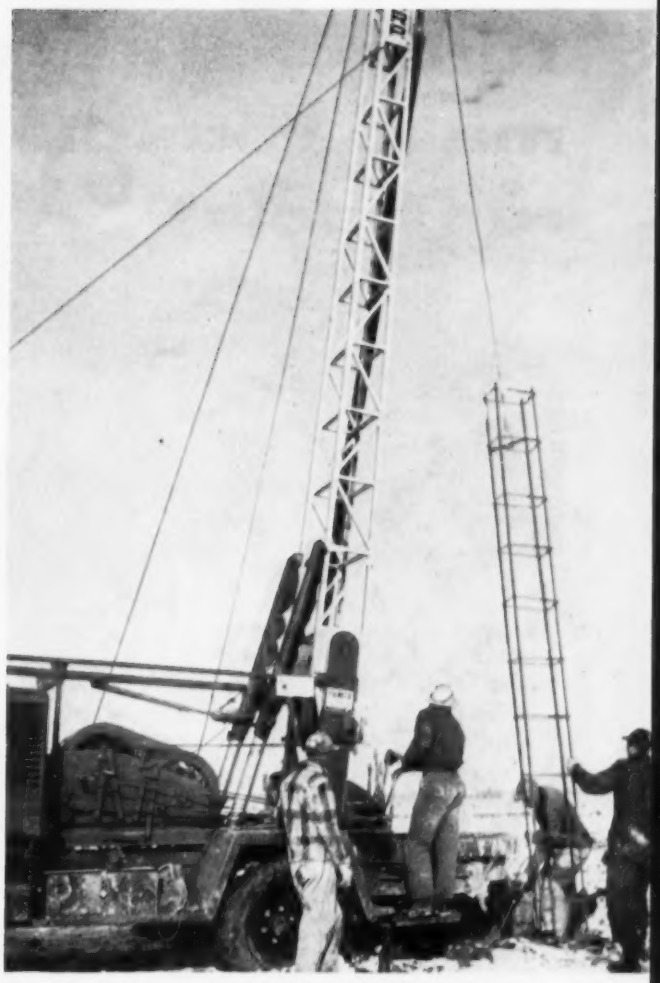
**Standard in Series 5-6-7-8-9-10000 models.*

. . . biggest sellers because they're the biggest savers! CHEVROLET

CHEVROLET TASK•FORCE 57 TRUCKS



BORING MACHINE picks up one of the casing liners used to prevent caving in loose ground. Casings were used for 25% of holes.



DRILL lifts reinforcing steel cage placed just ahead of concrete immediately following drilling of foundation holes.

dump location on the bucket pullers with which each rig was equipped.

If the holes were shallow, they could be drilled in one pass without drill stem additions. The machines can drill as deep as 200 ft by adding 20-ft drill stem increments. When the bearing material was reached, Calweld belling buckets were installed by drill operators, and the belled footings were dug.

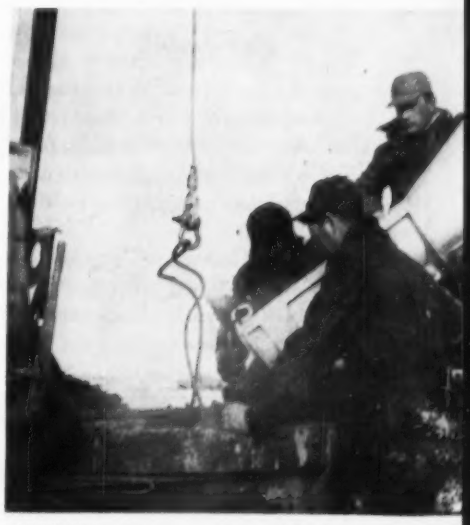
Concreting

When belling was completed, a swamper—who is really an expert caisson man from the old days when they were dug by hand—went down to inspect the bottom of the hole and clean up any loose dirt remaining. Usually this did not amount to more than a few shovelfuls.

Truck mixers from a nearby commercial plant moved in next to place concrete in the drilled hole. Reinforcing steel, made up on templates into a prefabbed cage, was slapped in place by the drill rigs. The concrete then was placed to ground surface, and dowel steel bars were inserted to tie the caissons monolithically to grade beams, whose construction would follow later.

If casing had to be used in the hole, the drill rigs stood by during the pouring and pulled the casing pipe before moving on to the next hole. If no casing was necessary, the machines moved on to the next hole as soon as the reinforcing steel cage was lowered into place.

During one rainy period work was suspended, but frozen ground failed to slow the rigs.



WORKMEN place concrete rapidly from placing spout of a transit-mix concrete truck.

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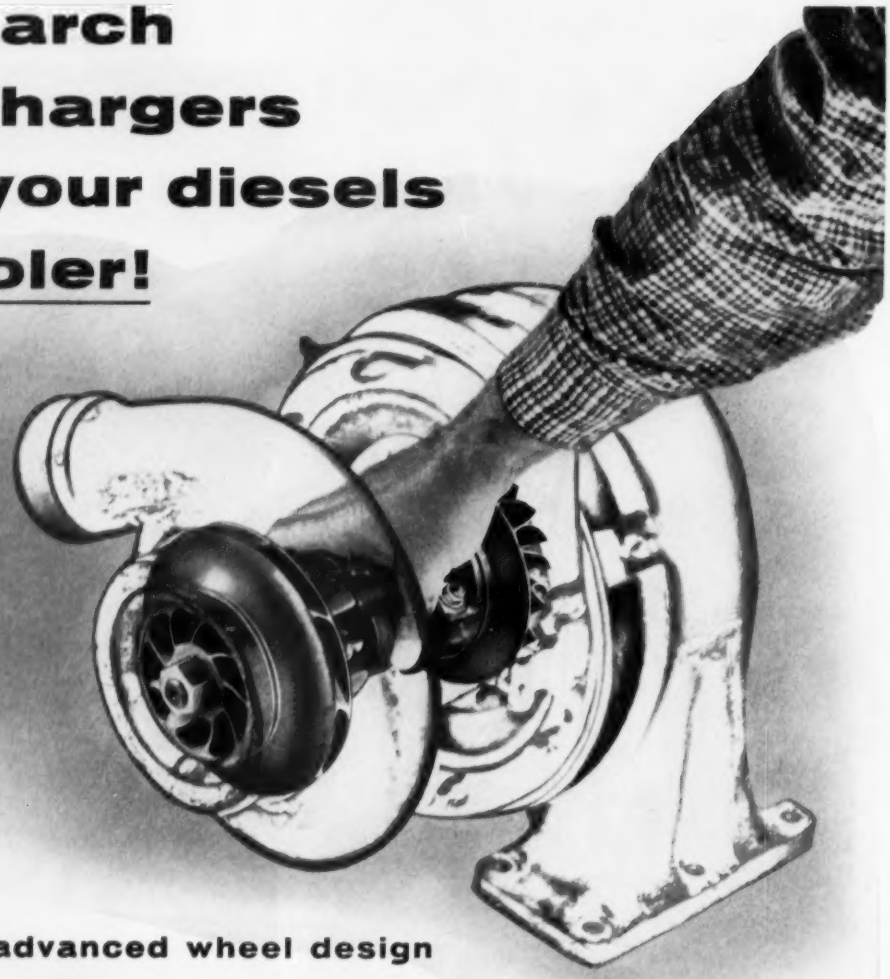

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MODEL	F-51	C-60	A-60	E-100	B-100
Diameter — in. nom.	9	11.5	15.25	15.25	16
Length — in.	9	14.12	16.75	17.25	21.75
Weight — lb.	40	95	125	135	195
Output — lb/min. (Standard Conditions)	25-40	35-65	35-65	70-95	115-175

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AiResearch Industrial Division

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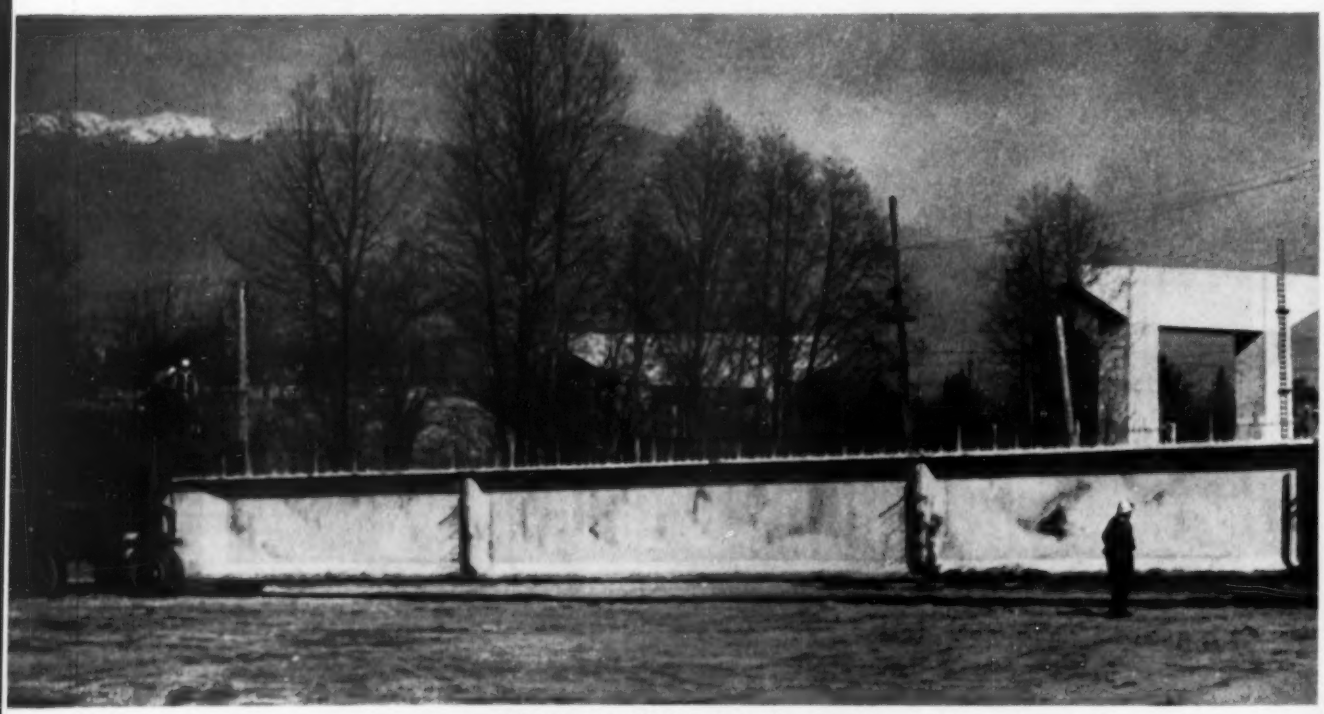
HUGE BUT EFFECTIVE—Rubber-tired dolly designed especially to haul massive precast bridge stringers has no locomotive power of its own. Though fitted with hydraulic lifting equipment, it must be pulled by tractor.

Dollies

STANDOUT PERFORMERS during fabrication of 108 post-tensioned concrete stringers for the $16 - million Second Narrows Bridge in Vancouver, Canada, are two huge, rubber-tired dollies.

Tractor-pulled, the unique dollies lift and transport the massive stringers, each of which weighs 72 tons, from casting yard to erection site. The dollies sharply resemble commercial straddle trucks but cannot move under their own power. They were designed and built especially for the job by order of joint venture contractors Peter Kiewit Sons' of Canada and Raymond International Co.

The bridge will have a cantilever span that will link metropolitan Vancouver with its suburban north shore across Burrard Inlet. It will form part of the massive Trans-Canada highway network. When completed it will rank second only



A HEAVY HAUL BEGINS—Caterpillar D6 cable-tows dollies carrying a freshly cast, 72-ton concrete stringer 120 ft long. Dolly idea was the dream child of Peter Kiewit Sons' of Canada

Haul Big Concrete Bridge Girders

to Quebec's St. Lawrence Bridge as the largest in the Dominion.

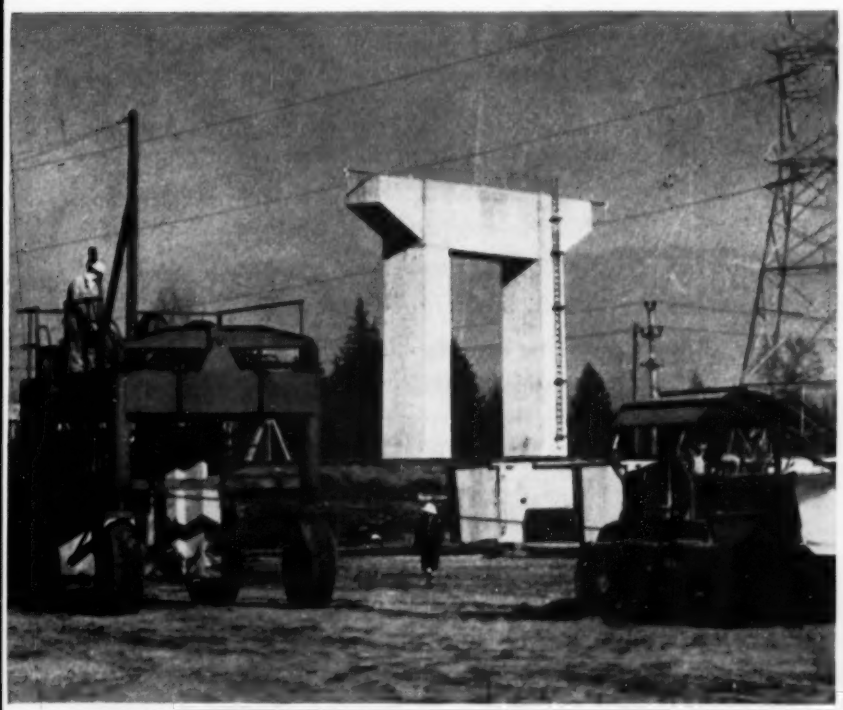
Stringers 12 abreast will connect 10 of the bridge's 17 concrete piers. They will support a six-lane, 80-ft-wide concrete deck on both approaches. Each stringer measures 120 ft long, stands 7 ft high, is 7½ in. thick, and has a top flange 36 in. wide and a bottom flange 21 in. wide.

When the contractors decided to do all casting on the job site, they had to devise a mass production method that would insure turning out the girders at a continuous, rapid clip. This is what they worked out:

FINAL RESTING PLACE—Stringers when completed will be placed 12 abreast to connect 10 of the bridge's 17 concrete piers. They will support a six-lane, 80-ft-wide deck of poured-in-place, post-tensioned concrete. Bridge, connecting Vancouver and its suburban north shore across Burrard Inlet, will form part of Trans-Canada highway network.

Casting Procedure

Their first step was to set up a casting yard. This consisted primarily of eight concrete casting beds and a single set of steel forms. Their plan was to pour one stringer a day to free a casting bed every eighth day.



and Raymond International Co., joint-venture contractors on the $16-million Second Narrows Bridge in Vancouver. Bridge will be the second largest in Canada.

Their operation is a neat one. Work on a stringer begins at 8 a.m. each day. A cage of reinforcing steel is fabricated and set up on the bed. The steel forms then are placed on either side of the cage. Finally, flexible hose cables containing wires for the post-tensioning are positioned. Each beam gets 10 cables containing 12 strands of 0.276-in. high-tensile wire.

Concreting begins shortly after noon and takes about three hours to complete. A 20-ft Mulkey conveyor belt 18 in. wide and set on wheels receives 5,000-psi concrete from transit-mix trucks and feeds it into the forms.

Concrete is vibrated by a combination of heavy Syntron electric external vibrators and Master internal vibrators worked in the concrete at a point just above the cables to prevent altering cable positions.

Steam Curing Follows

The stringer then is steam cured. Workmen make up tents of tar-

continued on page 126

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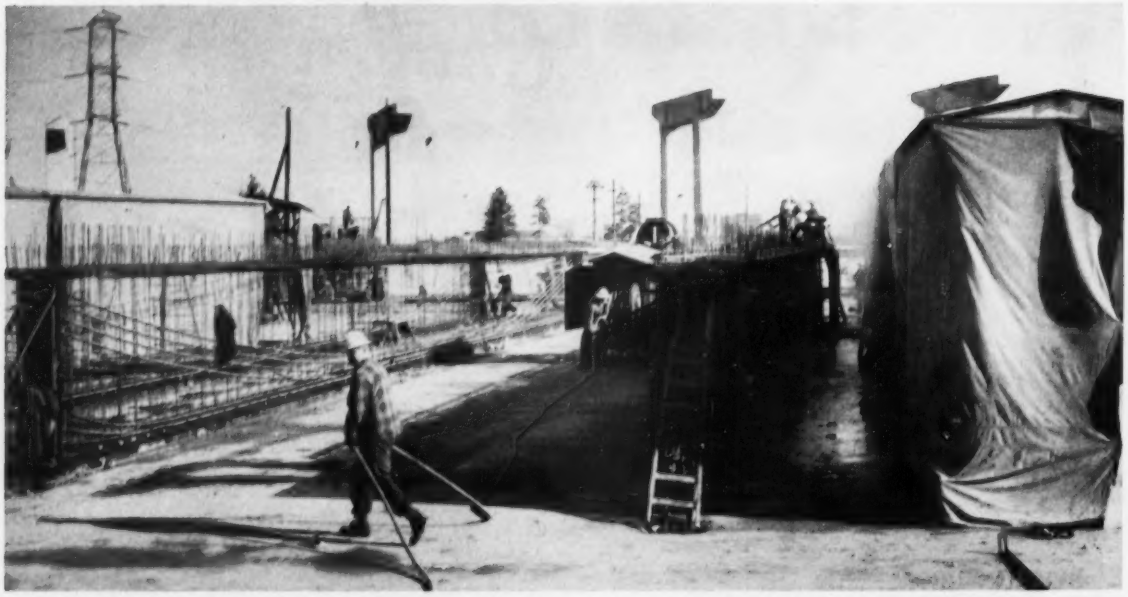

THREE STAGES OF CASTING—Stringers are turned out in casting yard on an eight-day schedule. A stringer is manufactured a day. Reinforcing cage together with cables awaits forming, left; a beam in concreted, center; another is steam cured, right.

FLEXIBLE HOSE IS PLACED—Workman ties hose containing wires to steel rods.

CONVEYOR PLACES CONCRETE—Transit-mix trucks supply 5,000-psi concrete.

TENSIONING BEGINS—Hydraulic jack starts tensioning first of beam's cables.

paulins over frames of Safeway tubular steel scaffolding set on casters. Each tent measures 22 ft in length and stands 10 ft high. Six are required to cover a stringer.

After tents are positioned, steam generated by a Malsbary 30-hp generator is fed into the tents through 1½-in. dia pipes. Pipes run into the concrete casting bed and protrude up through the surface on both sides of the stringers for their entire length.

Curing continues until 8 a.m. the next day. Tents are rolled away temporarily to permit stripping of forms. Then they are rolled back, and steam curing continues. Curing time ranges from between 42 to 60 hr depending on temperatures.

Post-Tensioning Begins

Stringer design requires the stressing of four of the ten cables on each stringer when concrete reaches 3,000 psi, the other six are stressed later. The Freyssinet

Power-Transfer Differentials put

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There's more punch — more push — more penetration with a "PAYLOADER" because automatic power-transfer differentials assure better traction in adverse conditions — on loose underfooting, sand, mud, snow and ice. If one wheel slips, more power is automatically transferred to the opposite wheel, enabling a "PAYLOADER" to keep driving forward, where ordinary tractor-shovels spin helplessly. You get traction and *action* instead of wheel-spinning, time-and-power-wasting *inaction.*

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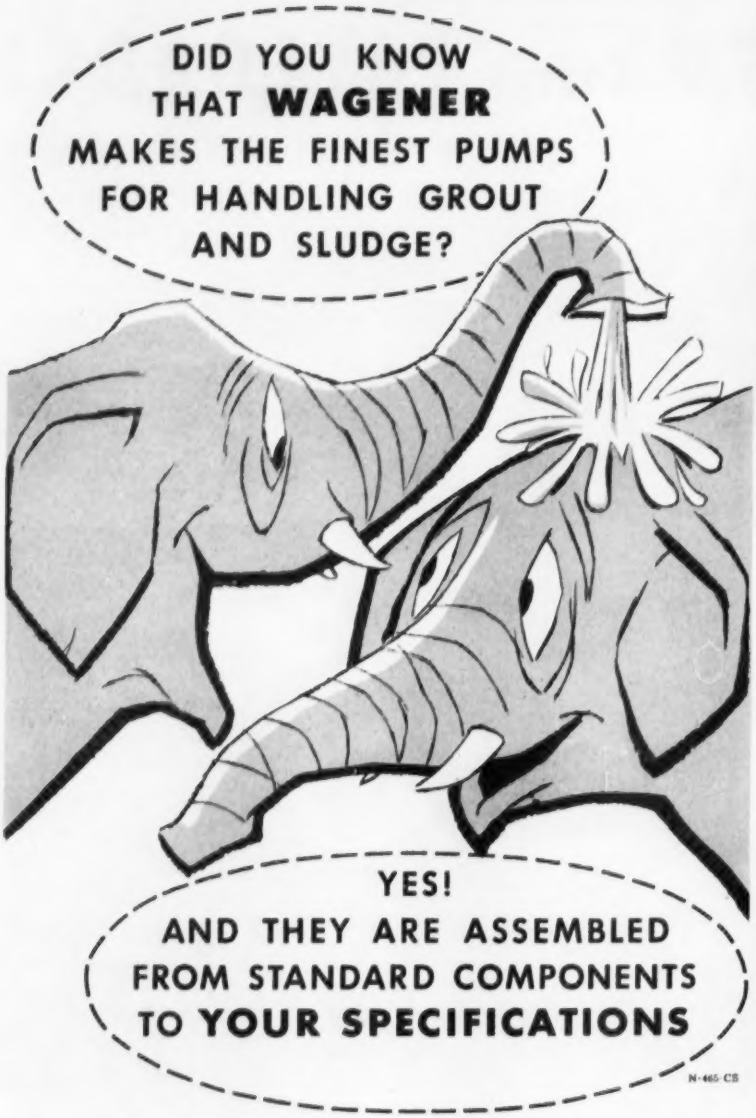

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Trouble-free pumping is assured by the sturdy construction of Wagener pumps. Self-sealing pumcup packing and divided piston rods reduce maintenance costs to the minimum.

Wagener pumps will pump anything that can be pumped . . . efficiently . . . economically . . . dependably. They offer almost unlimited flexibility in meeting power source and performance requirements. They are used by leading contractors all over the world.

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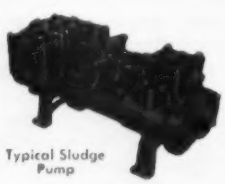

Typical Sludge Pump

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CANTON STOKERS

DOLLIES HAUL BIG GIRDERS . . .

continued from page 126

method of post-tensioning is used throughout.

Dollies Enter Picture

Each stringer is cast with a sleeve at each end through which a lifting bar can be inserted. The job of the dollies is to lift and transport the stringers from the casting beds to a storage area.

The dollies stand 15 ft high. Each has four steel legs set 10 ft apart in each direction. Legs sit on swivel wheels fitted with 16x-56-in., 32-ply bomber tires purchased from Air Force surplus.

A 60-ton hydraulic hoist made by Wagstaff-Hoist of Vancouver is mounted on top of each rig. A 12-hp Kohler gasoline engine drives the hydraulic pump. Small Char-Lyn hydraulic cylinders provide power to steer and brake dollies.

Dollies were designed especially for the job by A. D. Sanderson & Co., Ltd., of Vancouver, consulting engineers, and fabricated by Willock Truck Equipment Co., also of Vancouver.

When the time comes for removing a stringer, the dollies are pushed into position over each beam end by tractor or crane. A 4½-in. dia steel pin then is inserted through the stringer sleeve. Hoisting arms of the dollies are lowered to engage the pins.

The stringer next is lifted a few feet into the air, and a tractor begins towing the dollies by cable to the storage area. There the stringer is set down and permitted to cure until concrete reaches its designed 5,000 psi strength. Finally, the six remaining cables are tensioned. Wire ends are burned off, beam ends are grouted, and the stringers are ready for erection.

When required on the bridge, special equipment will hike them up to the maximum 90-ft height of the piers for positioning. The 12 beams of each bay will be connected by four concrete cross diaphrams cast and post-tensioned in place. Concrete deck slabs also will be cast and post-tensioned in place.

Bridge superstructure will be of steel. Dominion Bridge Co. of Canada will erect the span under an $11 million contract. High strength bolts will be used instead of rivets for field connections.

Project manager for the joint-venture contractors is J. D. Howell. John A. Guissinger, project engineer, designed the yard layout.

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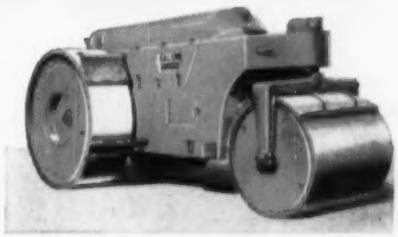

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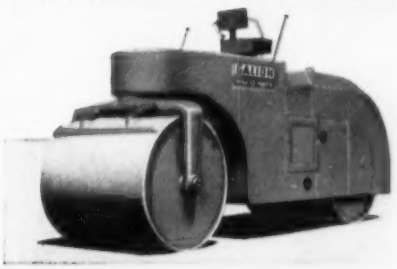

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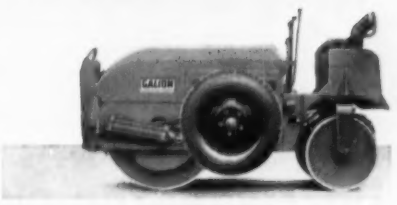
3-5 Ton Variable Weight
4-6 Ton with Retractable Wheels.



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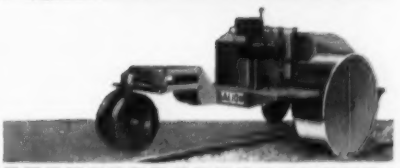

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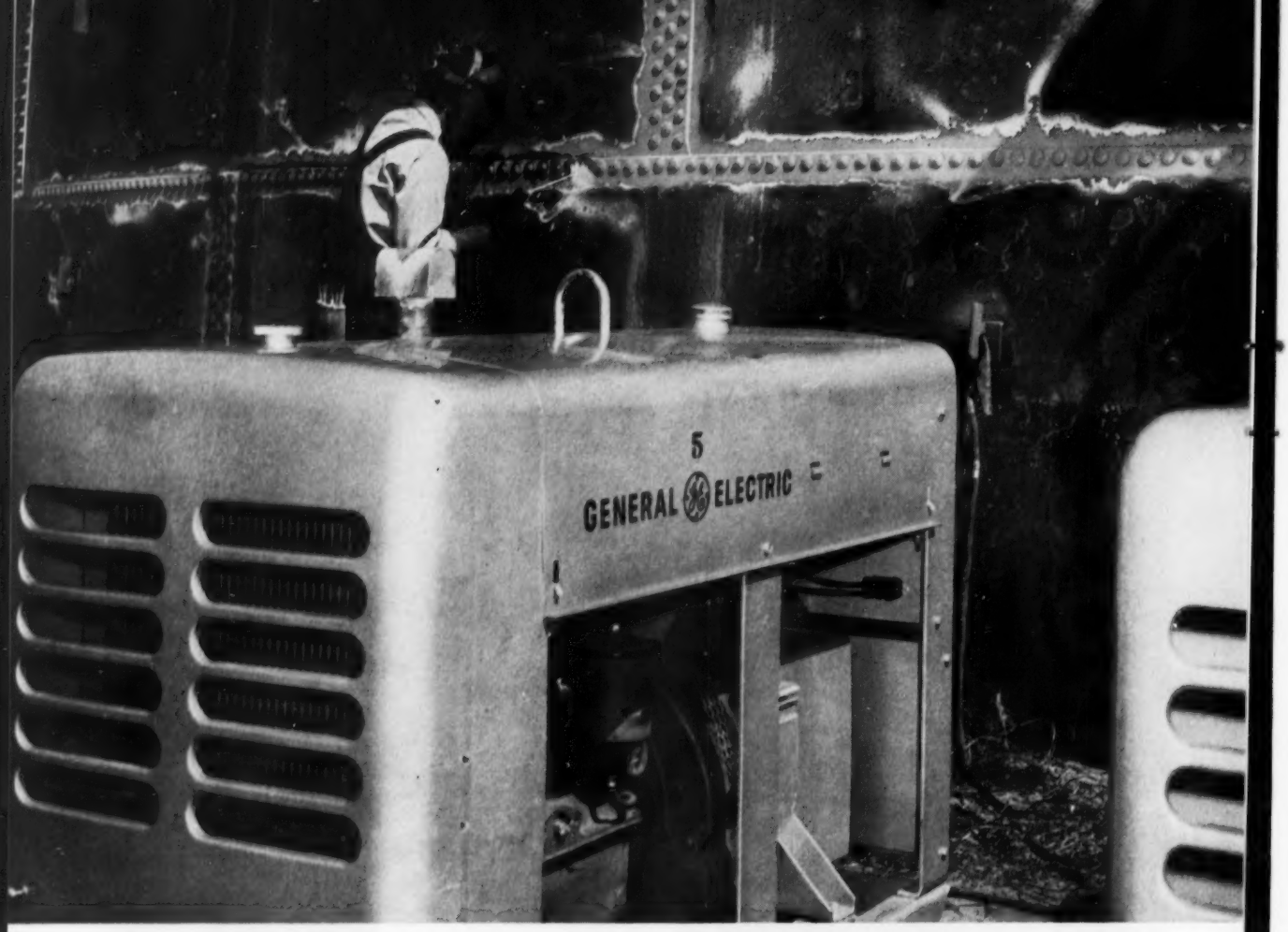


On round-the-clock repair job, General Electric engine-driven welders raise production 11%

S. R. Smith and Associates of Tulsa, Oklahoma recently tackled the job of repairing eleven leaky 55,000-gallon oil storage tanks. This required putting a weld around each rivet and along each seam. On this job they were forced to run six General Electric engine-driven welders on a three-shift, 24-hour day—often in temperatures of over 100°.

The results . . . an 11% increase in production, or a gain of one hour per day, per welding operator.

This gain was attributed by L. A. "Lon" Duvall, partner in the firm, to a reduction in downtime over their previous engine-driven welders.

Mr. Duvall said, "economy of these machines is another feature I like. Recently, we ran one wide open for eleven straight hours using your G-E ¼" W-612A rods, and the machine used only 16½ gallons of gasoline."

Whether your welding application is repair, construction, or job shop operation, you will find General Electric's line of 200-, 300-, and 400-ampere engine-driven welders operate with a minimum of maintenance or repair, while producing uniformly excellent welds.

What's more, General Electric gives you fast delivery and more dependable service on a complete line of high-quality a-c and d-c equipment, accessories, and electrodes for all your welding needs.

For more information, contact your nearest General Electric welding outlet, listed in the yellow pages of your telephone book. Or write for bulletin GED-3057 to Section 714-7, General Electric Co., Schenectady, New York.

GENERAL ELECTRIC

LOTS OF STEEL liner plates go into 28,000 ft of sewer tunnel. Bidding for this $7.5 million job, two Cincinnati contractors bought $1 million of plates before bids were opened when they heard rumors about a possible nation-wide steel strike.

Planning Pays on Sewer Job

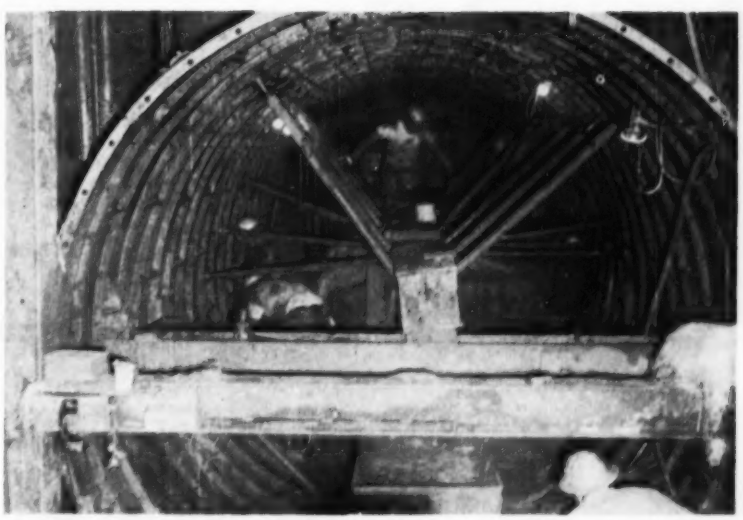
LAST YEAR'S steel strike may have hurt some contractors. But it helped two contractors in Cincinnati land $7.5 million in sewer contracts they might have lost without the strike.

Last year the city of Cincinnati decided to build a sewage disposal system. The multi-million-dollar Mill Creek Sewage Disposal Plant with some 28,000 ft. of interceptor sewers was planned.

Building the sewers figured to be tough. Tunnels would have to be mined through silt, glacial deposits, sand and gravel, old river bottom, and shale. Since each type of material would require different handling, the city decided to let five separate contracts.

Harry D. Foley and W. J. McCarthy of Foley Construction Co. and McCarthy Construction Co.

continued on page 134



NEEDLE BEAM supports jacks that retain arch liner plates while invert plates are being placed. Beam, used during soft ground tunneling, is moved ahead during mining.

Two NEW All-Weather rotary

No "dry-starts" even on coldest mornings

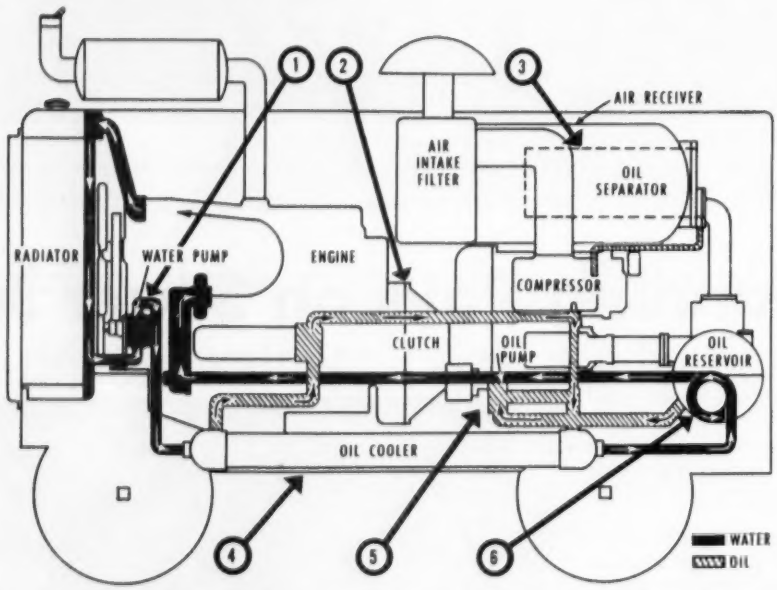
No overheating, even in desert-hot weather

Flow chart shows how Gardner-Denver water-oil cooling system operates

1 Water circulating system automatically provides constant operating temperature for both compressor and engine under all weather conditions—hot or cold.

2 Clutch eliminates cold-weather "dry-starts."

3 Effective oil separator minimizes oil consumption.



4 Circulating water cools compressor oil.

5 Oil pump provides positive flow of compressor oil.

6 Warm water from engine warms up compressor oil before clutch is engaged.

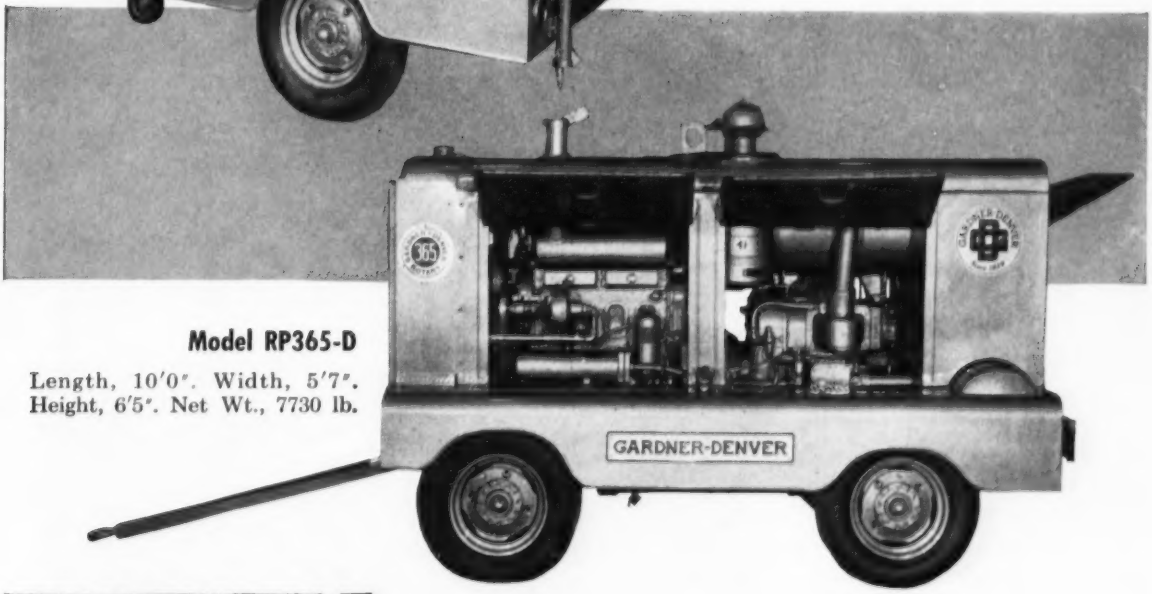
There's a Gardner-Denver Distributor in your area —see him for details

compressors by Gardner-Denver

feature the Gardner-Denver Water-Oil Cooling System

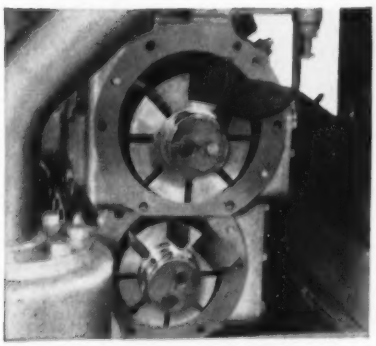
Model RP125

Length, 10′6″. Width, 4′8″. Height, 5′0″. Net Wt., 3540 lb. Available with gasoline or diesel engine.



Model RP365-D

Length, 10′0″. Width, 5′7″. Height, 6′5″. Net Wt., 7730 lb.



Plus these field-proved features of the Gardner-Denver RP600 and RP900 portables

Inspection of working parts can be made in minutes. Removing screws from easily accessible end plate exposes blades for service. No piping or tanks block the way.

- *Thriftmeter Control*
- *Vibrationless Operation*

Write for complete details.

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Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

PLANNING PAYS...
continued from page 131

their heads together to do some calculating. By combining forces and bidding low enough, they hoped to land all five contracts. Financially, they could handle them. Construction-wise, they could handle them. The only headache was making certain they got all five. To do so meant bidding lower for each contract than they normally would bid for each one separately.

Should one or more of the five be lost to them, they would have to do the remaining work at a cost margin too close for comfort.

Steel Strike Looms

During the Spring of last year rumors began drifting about of a possible nation-wide steel strike. A strike would pose a threat of a shortage of steel liner plates to line the tunnels and serve as forms for concrete lining. A large quantity of these plates would be needed for 28,000 ft. of tunnel.

The contractors saw in the possible strike a way to improve their chances of landing all five sewer contracts. They decided to buy up every loose liner plate they could get their hands on.

"We gambled," said Foley, "on the steel strike breaking and leaving us the only contractors with enough plating to do all the jobs."

They spent more than $1 million to buy up liner plates. Their construction yards were cluttered with mountains of steel plating.

Foley and McCarthy worked up their bids and submitted them for all five contracts. Almost simultaneously, the steel strike hit. Not only had they underbid the competition for the work, but they had all necessary liner plates to do the complete job. They even had a surplus.

"We figured to sell what we didn't need to other contractors," said Foley.

Construction Begins

Sewer tunnels in this job all are circular and concrete lined with diameters ranging from 6 to 11 ft. They run some 50 ft. below street level. Access is by shafts.

The contractors use two types of shafts to gain access to the tunneling—large rectangular shafts of heavily braced steel piling and circular shafts with unbraced liner plates.

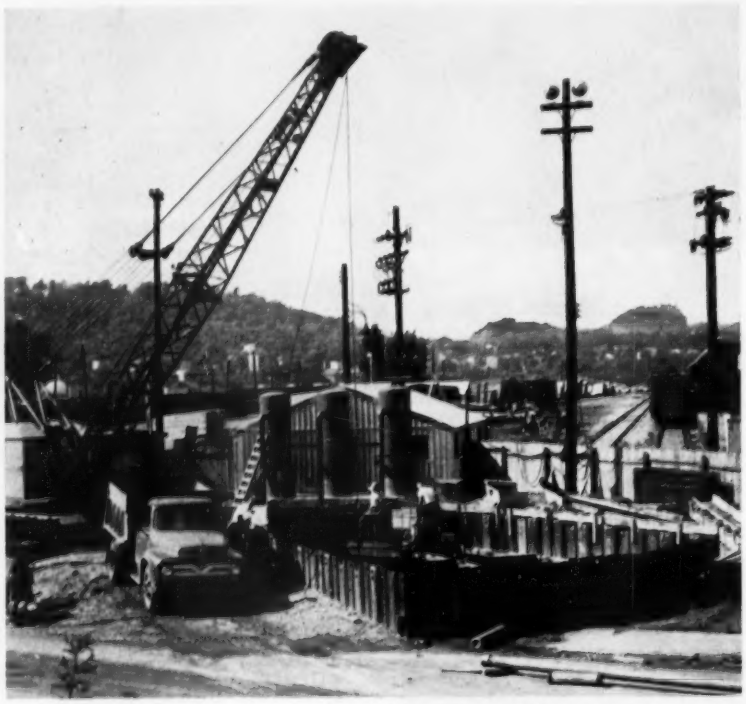
The rectangular shafts are dug where material to be tunneled through consists of soft or running ground. They are designed to permit removal of ground water by wellpoints, thus eliminating work under air in the running areas.

Sheet piling placed around the shaft perimeter is driven to a point below the water table (average 20 ft below street grade). The core is clamshelled out while piling is waled and braced top to bottom. Wellpoints then are set around the area, and the ground water is lowered to 50 ft below grade for an area measuring 200 x 200 ft.

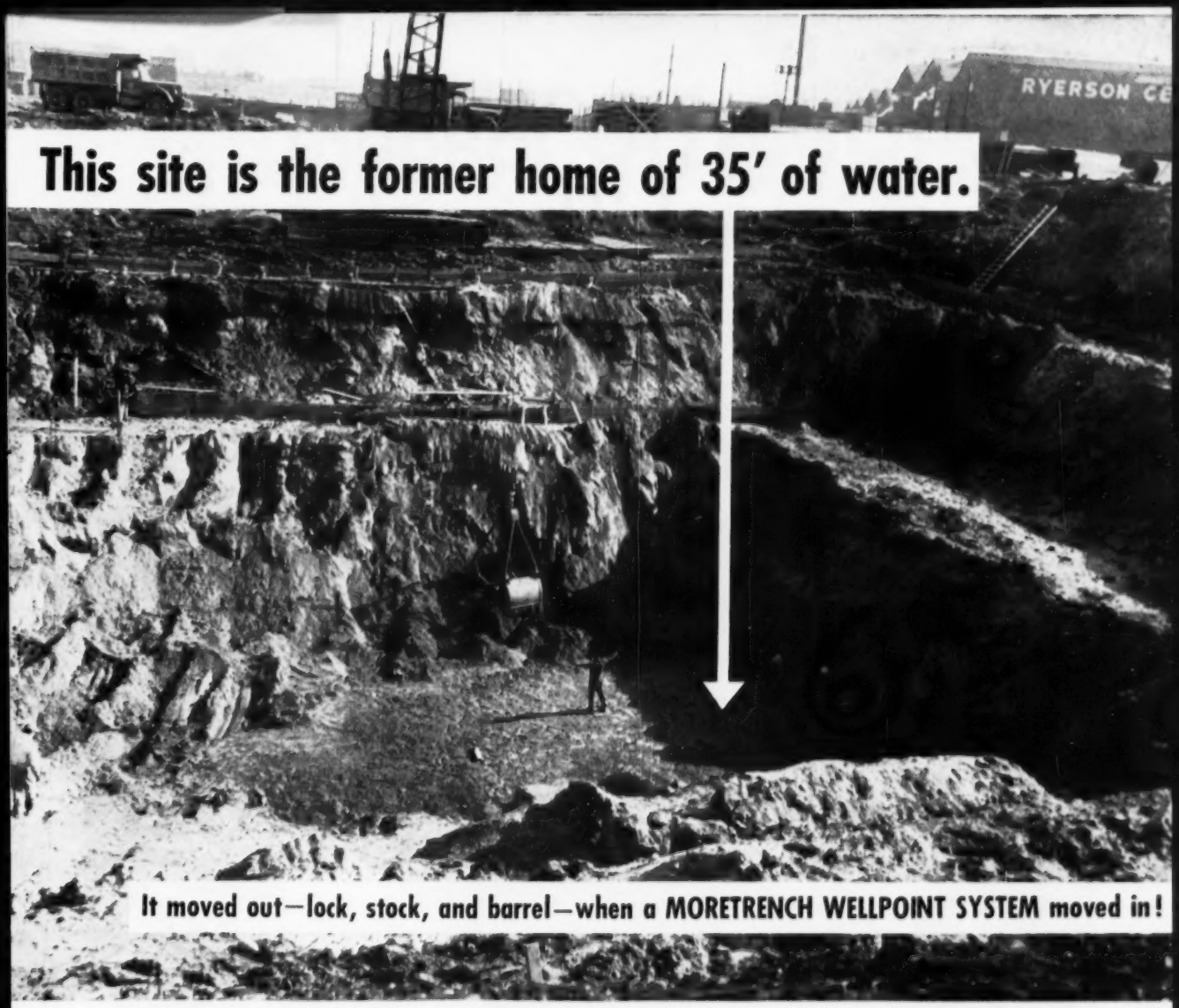
A second set of sheeting then is driven along the inside perimeter of the first set to several feet below tunnel grade. This core, too, is clamshelled out while walers and diagonal bracing are placed. The bottom of the shaft then is sealed with concrete to help hold back ground water. Wellpoints are operated continuously throughout mining operations.

continued on page 138

CONVEYOR LOADS muck into battleship on tunnel sections where mining is open face. Battleship then is pushed by hand to shaft where a crane lifts and unloads it into truck.



RECTANGULAR SHAFT made of sheet piling driven to 50 ft below street grade provides access to tunnels being driven through running ground. Shanty houses air compressor units.


RYERSON CE
This site is the former home of 35′ of water.
It moved out—lock, stock, and barrel—when a MORETRENCH WELLPOINT SYSTEM moved in!

Rapid Digging IN THE DRY Speeds Construction of Jersey City's Sewage Treatment Plant.

Garden State Constructors and Associates, Jersey City, contractors for this portion of the city's $25,000,000 sewerage project, know how quickly water can sabotage the progress of any job. That's why for quick, sure results in this mixed-up material (garbage fill, sand, silt and clay layers), they selected Moretrench to do the pumping.

When you have to deal with water, deal with Moretrench. Experienced engineers in any of our offices will be glad to analyze your problem, estimate on your requirements. The know-how of thirty years of pumping is at your disposal.

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GM TORQMATIC

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TORQMATIC DRIVES

big contractor says: "BANTAM is a necessary part of our equipment lineup"

works in tight spots where bigger rigs can't!

With all his other equipment (which includes 7 bigger excavators ranging up to 1½-yd. capacity), W. J. Lazynski, general contractor of Butler, Wis., knows the value of the BANTAM Method. Note how he uses it here.

Working along this busy Milwaukee highway, the BANTAM has the big job of installing 2000′ of storm sewer at 12′ depth. Limited space beside the heavy flow of traffic requires efficient close-range work.

ACCURATE BUCKET CONTROL IMPORTANT

Soft, sandy ground makes shoring necessary all the way. Working "blind" most of the time, the BANTAM operator is guided by hand signals. Inch-by-inch control of BANTAM's hoist line and boom makes a fast, safe job of setting the clamshell where a slip could seriously injure workers in the trench. Spoil is loaded into trucks.

The BANTAM handles the entire job of excavating, working at close quarters and under wires. As each section is completed, the BANTAM pulls shoring prior to backfilling.

"BANTAM is the only practical rig for jobs like this," says foreman John Drake.

BEST ALL-AROUND TOOL FOR HUNDREDS OF JOBS

With BANTAM—and your choice of 9 different quick-change attachments—you'll handle hundreds of digging, lifting, rigging and cleanup jobs at the lowest possible cost. BANTAM gets to the job faster, works faster. And BANTAM's low cost makes it your best paying investment. See your BANTAM distributor or write for literature.

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Self-Propelled — At the industry's lowest price!

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Crawler — Ground pressures as low as 2½ lbs. per sq. in.

CM-136

SCHIELD Bantam Co.

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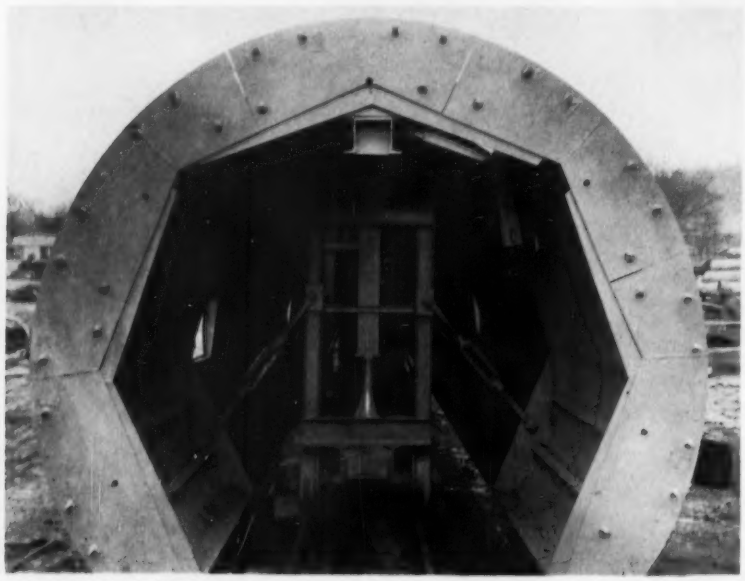
World's largest producer of truck cranes and excavators

ARCH FORMS are fabricated by the contractor and assembled into 20-ft sections in the tunnel. Contractor temporarily joined together several sections of the forms in his yard (above) to test connections after forms were fabricated.



RAILROAD CARRIAGE supports and moves form. Form is equipped with jacks that react against the tunnel invert to lock it into position before concreting of lining.

Circular shafts measuring about 11 ft in dia are driven where tunneling is through firm ground. Cores of these shafts are excavated by clamshell, and liner plates are placed top to bottom.

Mining By Hand

In the tunnels all mining, mucking, and loading is done by hand. Four-man crews work the smaller diameter tunnels, and eight-man crews work the larger. The contractors operate three continuous 8-hr shifts daily, and each crew makes an average heading of 10 ft per shift.

Where ground being tunneled is firm, mining is open face with liner plates installed directly behind muckers. Once liner plates are set, track is laid down, and battleship buckets set on rail carriages are run up to the heading. There, muckers load the carts directly by hand or by conveyor while a two-man trammer team pushes the load to the shaft where the battleship is hoisted by crane and its load dumped into waiting trucks.

In soft ground, top-heading-and-bench mining is the procedure. Once a bench is cut and the overhead braced, a narrow drift is mined by spade to seat a 10-ft-long needle beam. This is used to support trench jacks that hold tunnel arch during placing of liner plates.

When short stretches of running ground are encountered the contractors forepole until they reach firmer ground

For long stretches of running ground and where wellpoints would not be effective, the contractors go to air. They seldom use more than 8 psi. That proved adequate to return firm characteristics to the ground. Mucking is by hand.

Forming and Concreting

Invert forms are braced against the tunnel arch by jack poles and concreted. Track then is laid over invert concrete, and a form traveler is rolled into place. The form is set over a rail carriage at the heading and braced against the invert with jacks. Reinforcing steel is laid, forms are placed and concreting begins.

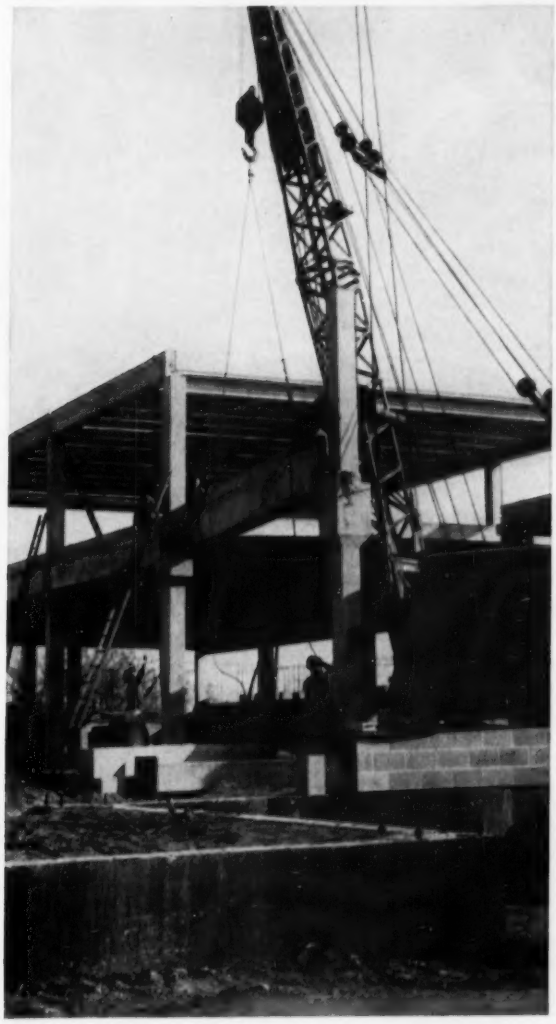
The tunnels call for 4,000-psi concrete. It is delivered to the job by transit-mix trucks and fed into concrete guns that shoot it through 6-in. pipe for placing between forms. Vibration is by internal and external pneumatic vibrators. A total of 25,000 yd will go into the job.

"Our planning seems to be paying off," said Foley. "First of all, bidding all five contracts permitted us to bid each one more cheaply than had we gone for individual contracts. Getting the liner plates insured our being able to handle the job."

Personnel

Contractor superintendents are Chuck Starrett, chief, Tony Skinder, and Gordon Gary.

Precast concrete frame erected in 9 working days!



Placing prestressed spandrel beam 28′ x 36″ x 18″ at new Albert Godde Bedin, Inc. plant, Depew, N. Y. Precast columns shown are 24′ x 14″ x 14″.

• The entire frame of this industrial plant in Depew, N. Y.—with a total floor area of 25,617 sq. ft.—was erected in *9 working days*.

Such fast work resulted from the use of prestressed concrete beams, floor and roof channels and precast columns, precision made by Frontier Dolomite Concrete Products Corporation, Lockport, N. Y.

IN THE MANUFACTURE OF THESE PRECAST UNITS, Lehigh Early Strength Cement and steam curing were used to achieve maximum production efficiency and economy. The concrete reached 3500 PSI in 12 hours, permitting removal of units and re-use of forms in *less than half the time required with regular portland cement.*

This is typical of the advantages of Lehigh Early Strength Cement in modern concrete construction.

Owner: Albert Godde Bedin, Inc., New York City

Architect: John R. Weber, New York City

Engineer: Freyssinet Company, Inc. New York City

Contractor: George W. Walker & Sons, Inc. Buffalo, N. Y.

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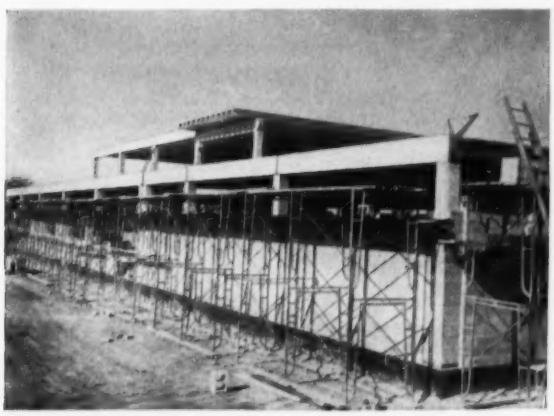
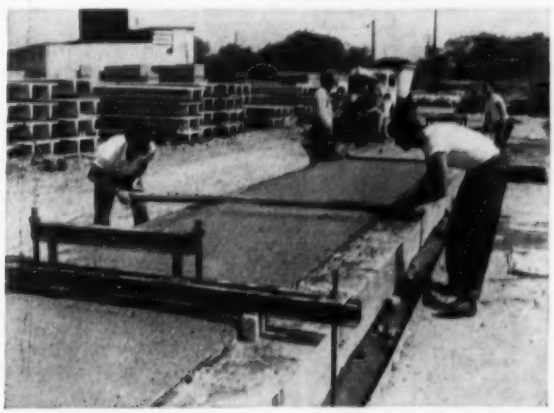


Frontier Dolomite also manufactured the concrete block for the exterior walls. Blocks were made with Lehigh Air-Entraining Cement.



Wood screeding prestressed double tee, 42′ long, 4′ wide, 14″ deep, at Frontier Dolomite plant.

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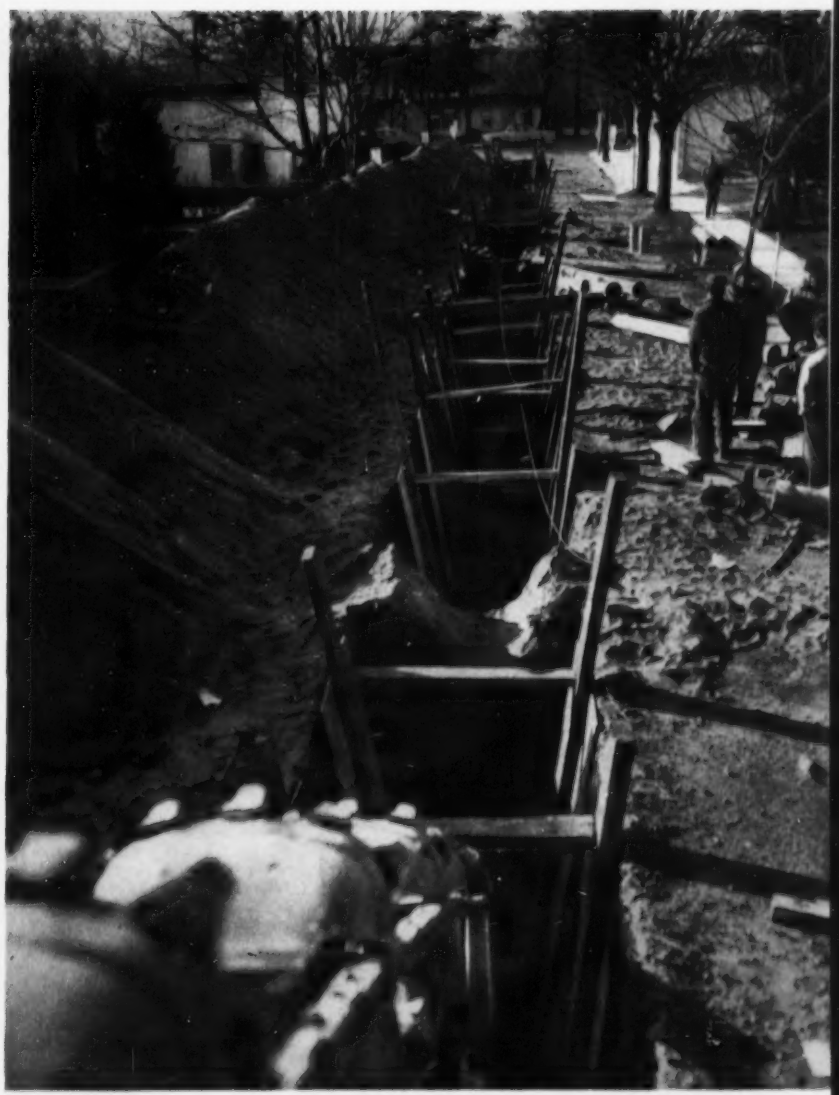
TRENCHER digs and workmen follow behind placing sheeting against trench.

TOP cross braces are wedged against vertical timber supports that hold plywood sheets.

BOTTOM braces are hammered into place by workman in trench prior to laying of pipe.



PANELS CUT DIGGING CREWS—By shoring trench banks on a Long Island sewer job with plywood instead of customary 2x10's, contractor cuts size of digging crews from 10 to 8 men.

Plywood Panels Hold High Trench Banks

PLYWOOD PANELS are proving a speedy, safe, and labor-saving way to brace the banks of high sewer trenches for Zara Construction Co. of Long Island.

Instead of placing 2x10-in. scaffold plank sections every 4 ft to brace trench walls, Zara substitutes 4x8-ft panels of ⅝-in. exterior plywood and reduces digging crews on his jobs from 10 to 8 men.

This is how the method works. A two-man crew follows directly behind the trencher to place plywood panels 2-ft apart along each freshly cut wall. The panels face each other on opposite sides of the trench. Then 8-ft, 3x8-in. uprights are nailed vertically to the center of each panel. Horizontal braces made of 5-ft lengths of timber next are forced between the vertical up-

A.S.T.M. A 325-55T WASHERS

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Michigan's New Mackinac Bridge—Detroit Times Photo

For fast reaction to your order, buy high strength construction washers direct from the manufacturer. You save time and money.

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Standard sizes stocked for immediate heat treat are: ½", ⅝", ¾", ⅞", 1", 1⅛" and 1¼". Other sizes available on request.

Delivery is fast and dependable. Try it and see.

* Hardness of 68 to 75 Rockwell A, and carburized to a minimum depth of 0.015 inch. Quenched and tempered (non-carburized) washers have a hardness of 35 to 45 Rockwell C.

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PLYWOOD BRACING...
continued

SEWER pipe is slipped into place. Bottom braces are removed where they slow work.

ELEVATION of pipe is checked before workmen begin backfilling the 8-ft-high trench.

rights across the trench, pressing the panels firmly against trench banks.

Finally, shorter lengths of 2x8-in. timber braces are forced into the same position near the bottom of the trench. All braces are nailed to vertical uprights to keep them from slipping. These lower braces are removed during installation of pipe.

Joe Gibbons, Zara's chief estimator, explains that the method proves particularly valuable in sandy areas. "Even though there is a space between the sheets," he says, "the sheeting tends to hold up that area by holding back the walls firmly on either side."

Tony Orsino, Zara's superintendent of construction crews, claims the method increases trench production about 200 ft per 8-hr shift. Besides labor, using plywood cuts down on lumber needed, too.

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Designed for Rough Terrain Work!

Steep grades, heavy mud, easy for the Ranger . . . the only *real* rough terrain fork truck! The condition of your yard is unimportant, for the all-new Ranger is built for *off-the-road* work . . . it performs best when the going's roughest. Four wheel drive gives the Ranger maximum performance under unbelievable conditions. A powerhouse, yet it's the most maneuverable truck of its kind on the market. But you've got to see the Ranger in action to believe it. Just for the asking we'll arrange a demonstration. Call your local Clark dealer, or write us direct.

Your local Clark dealer is listed in the Yellow Pages.

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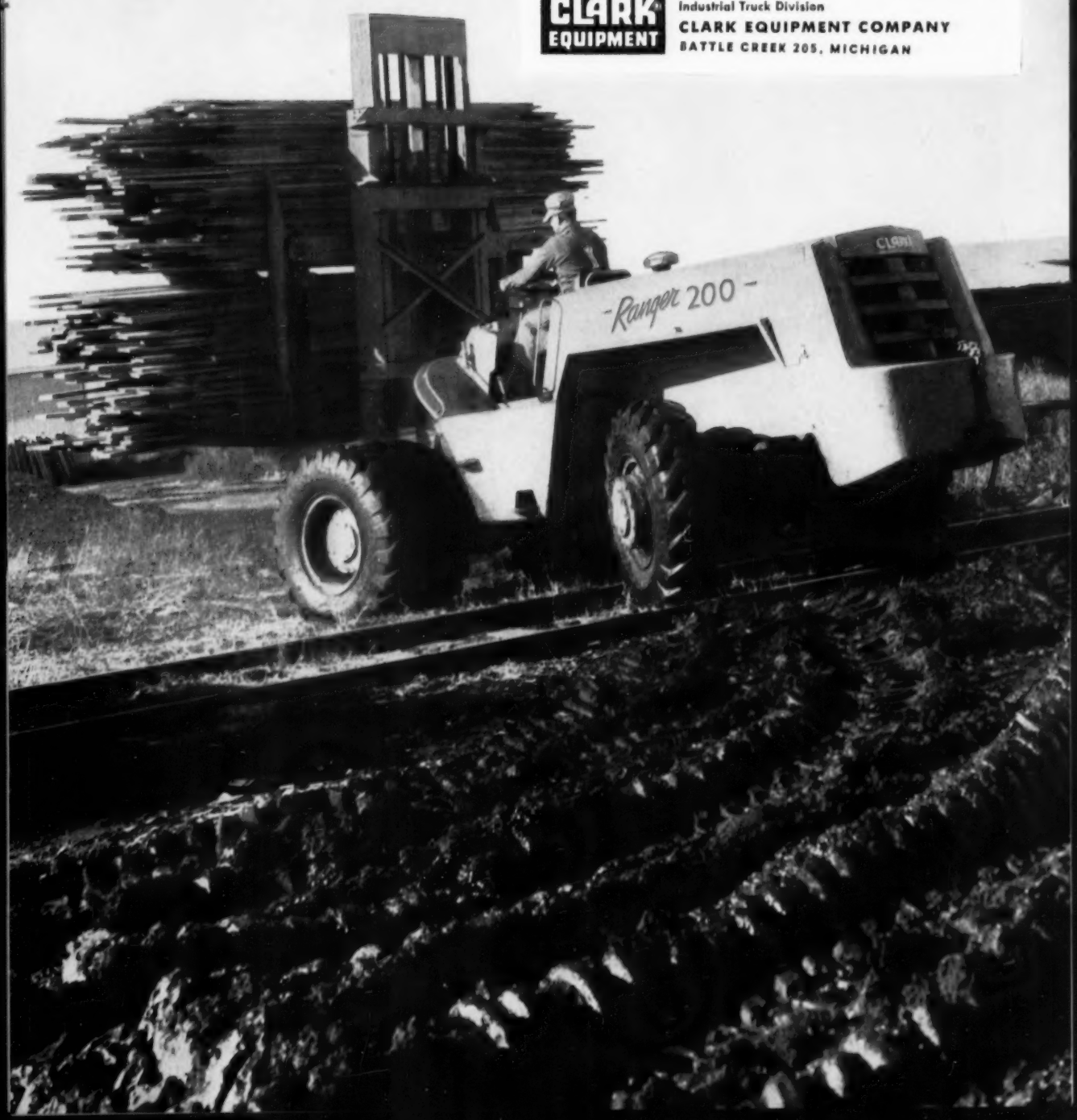

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These flexible 2-cycle Diesels drive 117 models of excavators, cranes and draglines built by 23 manufacturers; 11 different makes of portable and stationary air compressors; plus rock crushers, pumps, loaders, and the world's most powerful tractors and earth-movers.

In fact, GM Detroit Diesels lead as the work horses of industry—proving their superiority over both gasoline engines and other Diesels in more than 1,000 different applications of power machinery on jobs from 30 h.p. up.

For dependable, moneysaving power in sensible size and weight, it will pay you to specify GM Detroit Diesel in any equipment you build, buy or repower. It's America's FIRST CHOICE Diesel *because it does more work at less cost!*

Single Engines...30 to 300 H.P. *Multiple Units...Up to 893 H.P.*

# of all building trades?

Shown above are Thew-Lorain backhoe, Marion cranes, Ingersoll-Rand air compressor, and LeTourneau-Westinghouse rear dump. Write for booklet listing over 1,000 GM Detroit Diesel power applications.

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An overhead blow can cause the unreinforced crown to depress. This allows the impact of the blow to touch the top of your skull causing concussion, a fracture or even death.

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*From Report B1-R6, helmet comparative impact performance data for 1¼" crown clearance (8 lb. drop ball test).

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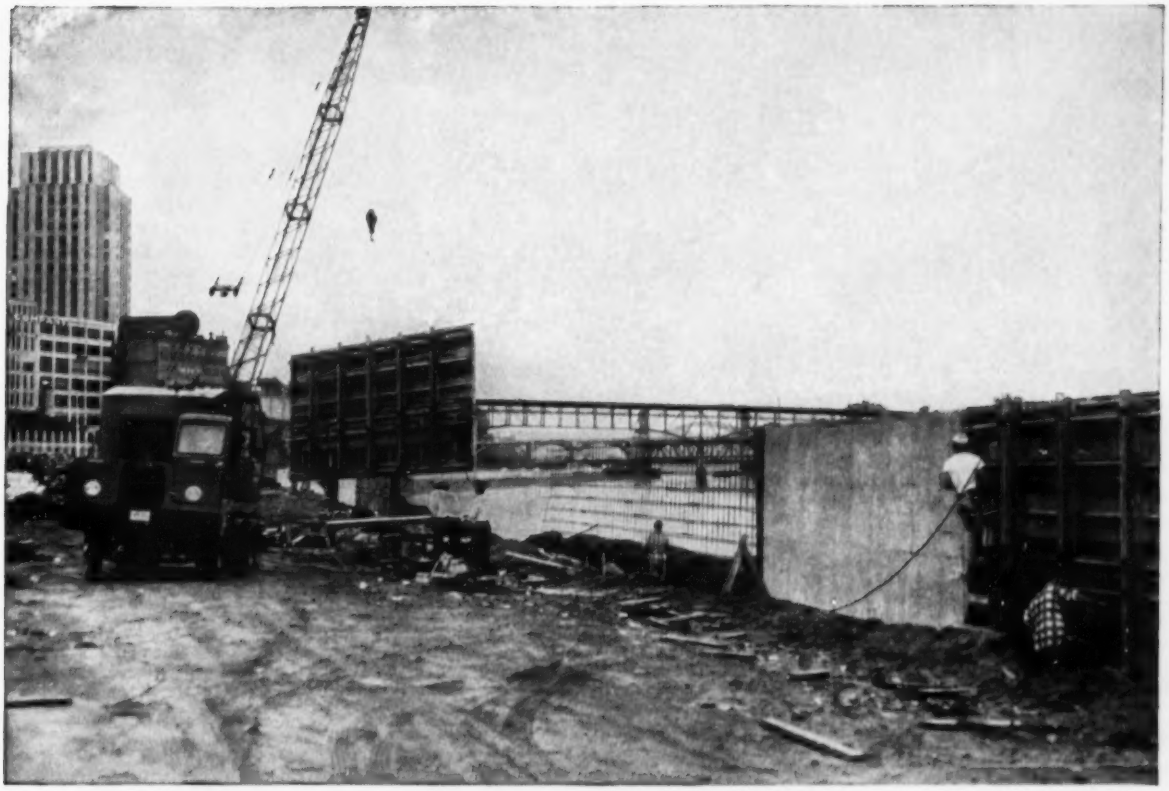
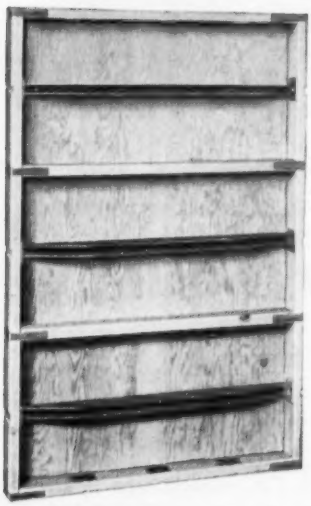


2,400 foot retaining wall poured prior to construction of Shepard Road, a main traffic artery in St. Paul, Minnesota.

70 feet of river retaining wall completed in one pour by GANG FORMING

SYMONS Wide Panel Forms



Symons Steel Strut Wide Panel Forms have 2 x 4 cross members to strengthen the panel and minimize deflection when pouring. Panels are built in 6′ and 8′ lengths and 30″, 36″ and 48″ widths. Fewer panels per job are required with Steel Strut Wide Panels.

Pouring of a 2,400 foot retaining wall along the north bank of the Mississippi River in downtown St. Paul was accomplished with Symons Wide Panel Forms made up in gang sections of 10′ x 24′ and 15′ x 24′. Panels 4′ x 6′ and 3′ x 6′ were used to form the sections.

Hurley Construction Company, St. Paul, contractor on the job, used only 5,400 square feet of Symons Wide Panel Forms. By gang forming, Hurley was able to speed construction and meet tight time schedule. 70 lineal feet of concrete was poured in one pour with a maximum pour of 700 lineal feet in one week. Walls were battered, 19 inches at the bottom and 12 inches at the top.

Handling of the sections with a crane was made easy by using a cable behind the top waler and a 3 by 8 plank permanently bolted about 18 inches from the bottom of the section. Walers and stiff backs were put on permanently.

Engineering Service—Our Engineering service includes preparing, from your plans, a complete form layout and costs sheets—no charge or obligation. For additional information on Symons products and services send for our FREE catalog.

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Organization Pays Off When . . .

Handling a Job With Your Own Forces

EDITOR'S NOTE. Philadelphia's Penn Center is a $105-million reconstruction project that literally will change the face of the oldest part of the city. It includes the replacing of old railroad and office structures with huge new office buildings, underground shopping concourses, hotels, and apartment houses. McCloskey & Co., well-known Philadelphia builders, are doing a large portion of their $35 million shares of the work with their own forces. Such a big labor force can be hard to organize and manage efficiently. So we asked the firm's vice president how McCloskey handles this problem.

By MATTHEW H. MCCLOSKEY, III
Vice President
McCloskey & Co., Inc.

USING OUR OWN MEN for as much of the work as possible saves us considerable money on most McCloskey jobs. And it really is paying off on our $35 million part of the Penn Center Development here in Philadelphia.

Our own forces are handling demolition, excavation, concrete work, carpentry, masonry, and other odds and ends. Most builders might do some portion of the work themselves. But they probably would farm a lot of it out to subcontractors.

Likes to Keep Profits

The profit subcontractors work for, however, is a profit we like to keep for ourselves. And we're glad to be able to avoid those time-consuming battles between subs as to who should be on the job at what time.

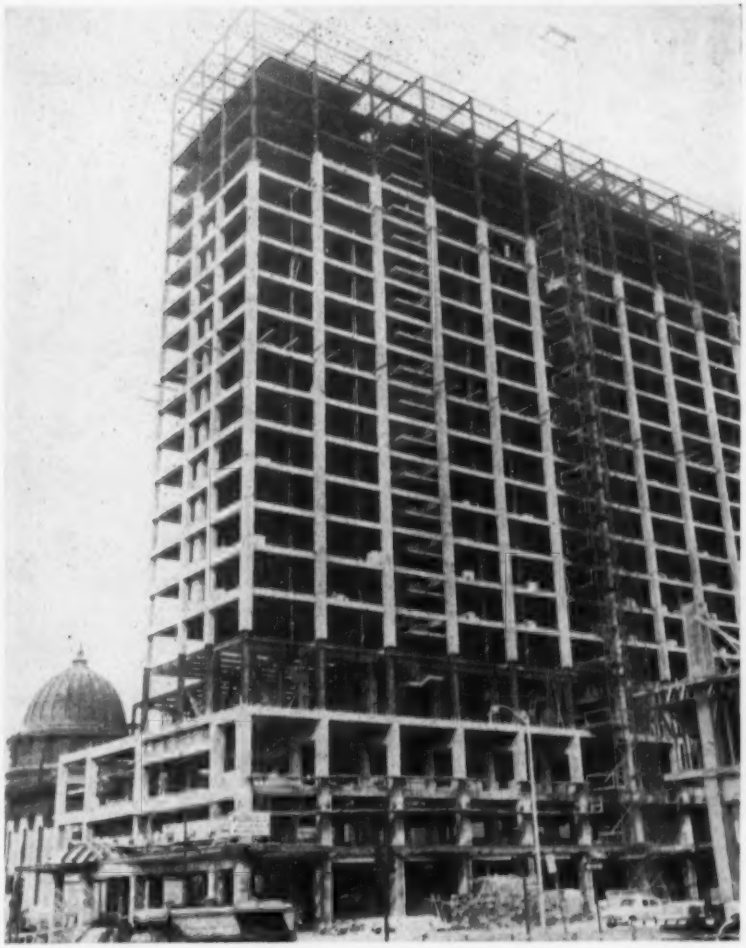
But, though using your own forces can be profitable, it requires care. For even a single job you have to guard against both overmanning and undermanning. The problem really multiplies when your crews are working on several different types of construction, underground concourses, tunnels, foundations, and demolition.

Judge for yourself. We're putting up a $15 million, 22-story hotel. This is a structural steel job with reinforced concrete slabs. Then we have a $5 million demolition of stone and concrete retaining walls that served as railroad track abutments.

There's a $14 million Transportation Center that really is two buildings in one: a three-story, reinforced concrete bus terminal and an 18-story office building. We have, too, $500,000 in connecting sewers, some tunneled, some placed in trenches; $2 million in underground concourses; considerable underpinning and connecting ramp work; and many other appurtenant pieces of construction. Put these all together, work a large part of the job with your own forces, and you can see what kind of problem labor management can be.

All Structures Are Different

It would be easy to organize a work force for a number of typical structures. Single crews simply could work from one structure to

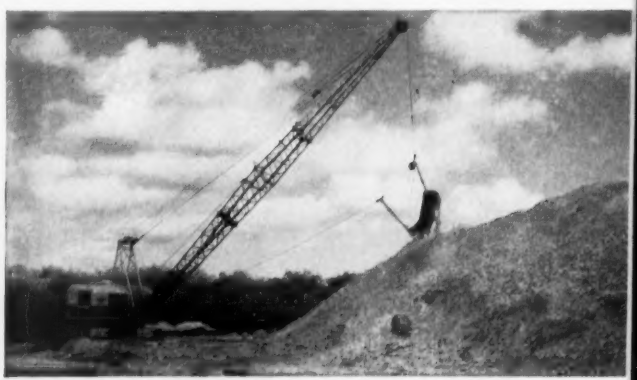


USING TWO CREWS, contractor simultaneously works first to sixth floors, and sixth to 22nd floors, on a $15-million hotel. Technique cut concreting time almost in half.

WORKMEN TIGHTENS high tensile bolt with impact wrench on hotel girder connection. Job marks the first use of high strength bolts in Philadelphia's construction history.

Lima Type 1201 dragline equipped with an 85-ft. boom, dredging channel into Biscayne Bay at Ojus, Fla. Approximately 250,000 cu. yds. of sand and coral rock will be moved to complete this job.

LIMA dragline speeds dredging operation in Florida



This big Lima Type 1201, owned by L. C. Morris, Inc., of Miami, Fla., is making quick work of dredging a channel into Biscayne Bay. Day in and day out, their Lima takes fast, steady bites of sand and coral rock. It's the built-in quality extras—such as piston-ring-type dirt seals and retainers in crawler rollers... flame or induction-hardened moving parts for longer life . . . properly balanced weight for maximum efficiency . . . anti-friction bearings at all important points . . . oversize drums and sheaves for long cable life . . . and extra-wide, extra-long crawlers for greater stability—that result in big production with minimum repair and maintenance.

It will pay you to get the full story on Limas from your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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Shovels . . ½ to 6 cu. yds.
Cranes . . to 110 tons
Draglines . . . variable
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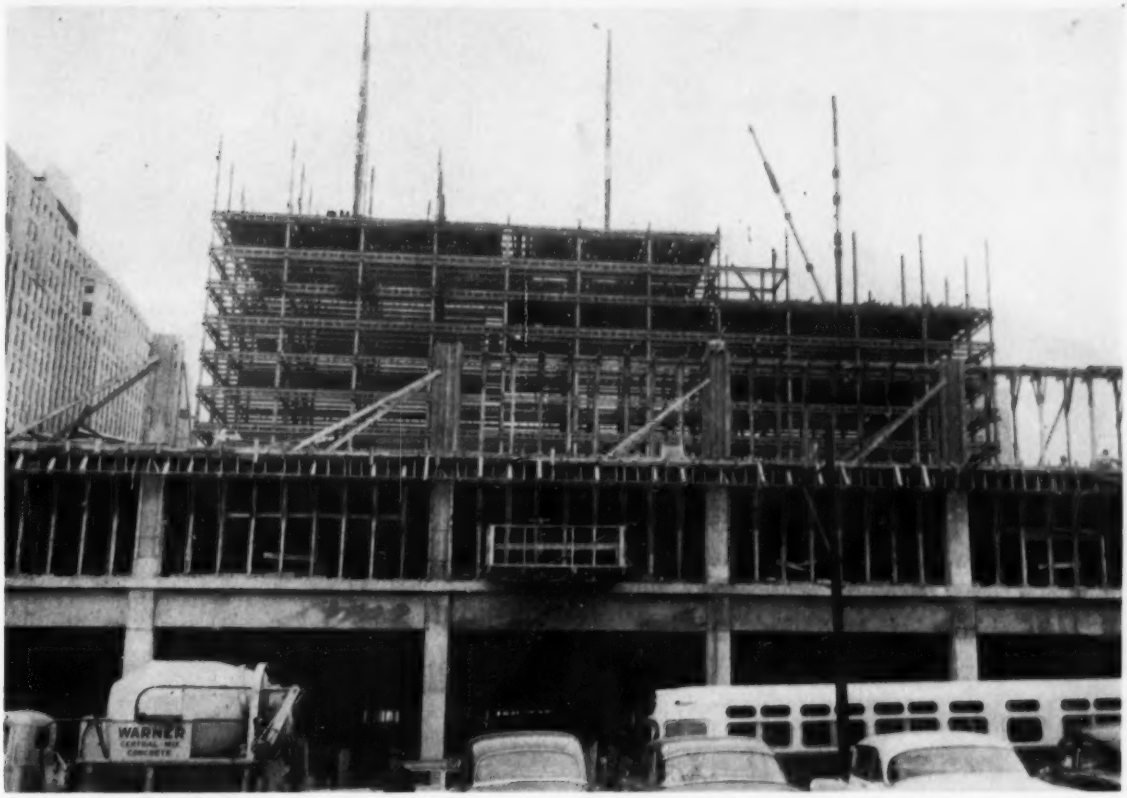

TRANSPORTATION CENTER is a $14 million structure made up of a 3-story reinforced concrete bus terminal (foreground) and an 18-story structural steel office building. Street in foreground will be cut open to permit installation of an approach ramp.

SEWER WORK consists of 1,200 ft of concrete pipe laid in open-cut trenches and 900 ft of line tunneled by hand mining methods.

SHOVELS DIG ramp approach to bus terminal. Building in background is being underpinned. Ramp walls will pass in front.

FIRST FLOOR SLAB of tower portion is reinforced concrete while remaining floors are slabs poured on Inland's cellufloor.

BUS TERMINAL slabs all are of reinforced concrete grid construction. Rubber tired carts are used to move forms about.

WORKMEN VIBRATE recently poured concrete. Buggies move material to pour site over buggy runs set on deck forms.

HANDLING OWN FORCES . . .
continued

another, repeating their operations. But here, each structure is totally different, both in design and size. Our aim was to keep the number of men assigned to each job down to a minimum, yet get the job efficiently done.

800 Men Needed

Minimum labor needs for the development amount to about 800 men. This would include 270 men for the hotel; 321 men for the Transportation Center, 82 men for the sewers, and 130 men for the underground concourses and ramps.

But job needs from time to time rose above their minimum. We estimated that to have a force on hand to meet peak requirements would have meant putting on an additional 300 men. Naturally, this is too costly. We had no continuous use for these 300 men, and the process of putting on men and laying them off can be rather costly in itself.

We found we could solve this problem by creating a sort of traveling work force of about 150 men of various trades that would be available to all jobs in the development as needed.

Sounds simple enough, but keeping the men on this mobile force moving effectively is not easy. Men have to be ordered to a job at least the day before. That means that work schedules must be tightly planned. And such planning requires close liaison between field-force superintendents and front office.

Close Liaison Helps

My brother Tom and a cousin Jim, co-project managers of the development are in constant check with field superintendents as to work schedules and labor needs at least 24 hr in advance.

Assisting them is our veteran general superintendent Nelson Tallman, who is in charge of overall field supervision. He sees that no job ever is stripped of its required force or loaded with men beyond its needs.

To assist him, each job has a field superintendent. For the hotel there's Henry E. Quinn; the Transportation Center, John P. Billie; ramps, underpinning, and underground concourses, Stanley Czapkewicz; and for the sewer work, Clarence Jones. These men not only supervise and oversee construction of each individual job, but by constant check with foremen of each trade, they are able to communicate job needs with general superintendent Tallman. Other foremen also report to Tallman.

Miscues Sometimes Come

Occasionally we have a miscue —men on a job when they are not needed. But miscues often come about as a result of material delivery delay or some such cause rather than liaison failure between superintendents. This has been minor, however. Proof of the pudding is that our job-manning system pays off not only in better job control, profits that do not have to be paid of subcontractors, but in savings in our own overall job payrolls as well.

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Can you afford to build a pyramid by hand? Of course not—no more than you can afford obsolete compaction methods in today's competitive construction market. The Engineers at "JAY" Company are compaction pioneers. The Jay Tamper has proven itself by giving high uniform densities in all types of material at savings of up to twenty to one over old style or unproven equipment. The new modern "JAY" Model 12 or 36 (as shown) is completely self contained and self propelled, needs no expensive auxiliary equipment and is operated by only one man. Start putting profit in your pocket now! Make the job pay $ $ $ order your "JAY" today.

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And *all* axles–front and rear–are oversize. There's a selection of rugged transmissions. Safety Power Steering* is available on every model. ***And many of them now offer GMC's new front engine PTO* for transit-mix work.***

Add it all up and it's easy to see what's making these GMC Money-Makers the hands-down choice of more and more truck-users. For the full story on any one of them, see your GMC dealer! **Optional at extra cost*

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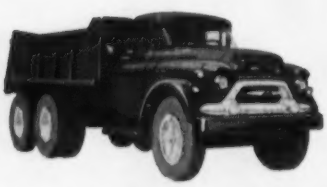
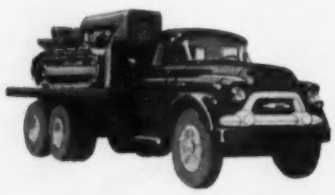
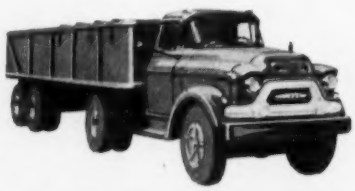


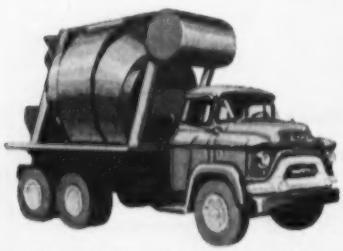
SERIES W500 Tandem Money-Makers –206-h.p. V8 engine. 32,000 lbs. GVW–55,000 lbs. GCW. Axles: 7,000 lbs. front; 28,000 lbs. tandem rear. Three wheelbases 158"-194".



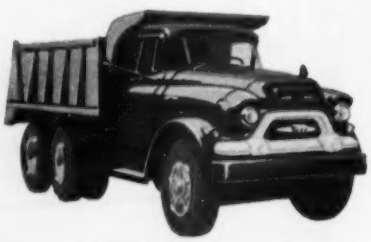
SERIES W550 Tandem Money-Makers –232-h.p. V8 engine. 40,000 lbs. GVW –60,000 lbs. GCW. Axles: 9,000 lbs. front; 34,000 lbs. tandem rear. Four wheelbases 146"-194".



SERIES 630A Money-Makers –220-h.p. Six. 29,000 lbs. GVW–55,000 lbs. GCW. Axles: 9,000 lbs. front; 21,000 lbs. rear. Five wheelbases 141"-201".



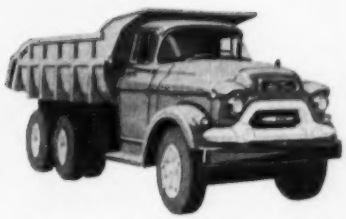
SERIES FW550 Tandem Money-Makers – 232-h.p. V8 engine. 89" cab. 42,000 lbs. GVW–60,000 lbs. GCW. Axles: 9,000 lbs. front; 34,000 lbs. tandem rear. Five wheelbases 139"-175".



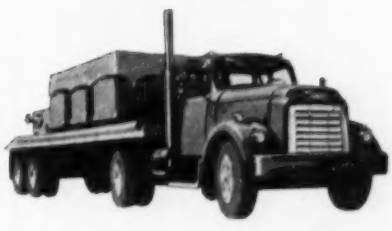
SERIES W630 Tandem Money-Makers –220-h.p. Six. 42,000 lbs. GVW–65,000 lbs. GCW. Axles: 9,000 lbs. front; 34,000 lbs. tandem rear. Four wheelbases 153"-201".

SERIES 660 Money-Makers – 220-h.p. Six. 30,000 lbs. GVW–65,000 lbs. GCW. Axles: 9,000 lbs. front; 22,000 lbs. rear. Three wheelbases 141"-165".

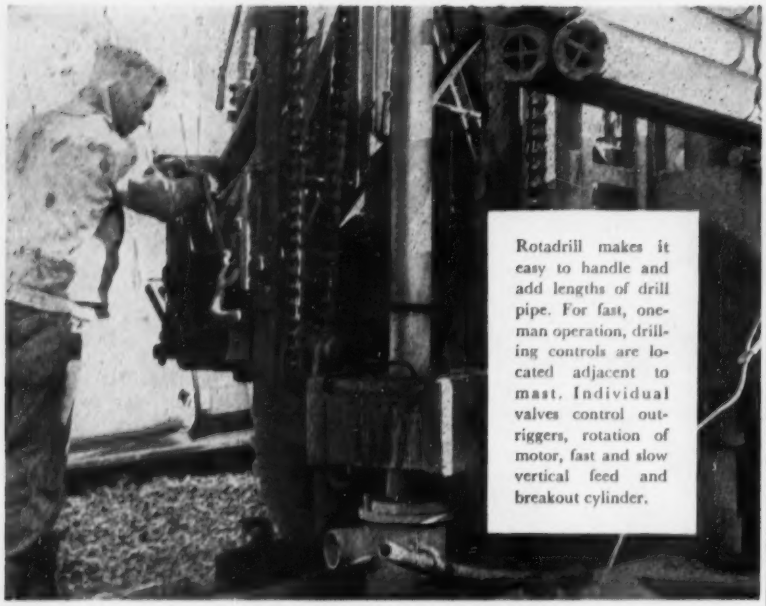
SERIES W660 Tandem Money-Makers—220-h.p. Six. 46,000 lbs. GVW—70,000 lbs. GCW. Axles: 11,000 lbs. front; 36,000 lbs. tandem rear. Four wheelbases 165"-201".



SERIES W670 Tandem Money-Makers—220-h.p. Six. 59,000 lbs. GVW—90,000 lbs. GCW. Axles: 11,000 lbs. front; 48,000 lbs. tandem rear. Three wheelbases 177"-191".



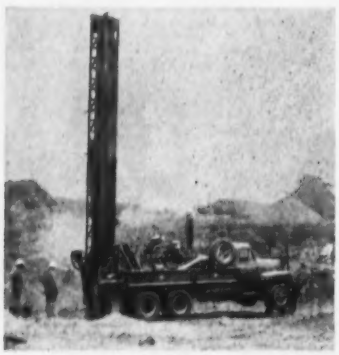
SERIES D930 Diesel Money-Makers—236-h.p. Turbopower Diesel. 33,000 lbs. GVW—70,000 lbs. GCW. Axles: 11,000 lbs. front; 22,000 lbs. rear. Two wheelbases 152"-164".



Rotadrill makes it easy to handle and add lengths of drill pipe. For fast, one-man operation, drilling controls are located adjacent to mast. Individual valves control outriggers, rotation of motor, fast and slow vertical feed and breakout cylinder.

FIELD TESTS PROVE:

One man can add drill pipe in 5 minutes



Fast drilling is indicated by heavy dust coming from primary dust collector and very fine dust blowing from stack. Note position of Truck Mounted Rotadrill—right at edge of excavation. You can drive this unit right to the job—even in locations where bigger rigs can't go.

Heavy structural steel mast, raised and lowered hydraulically, travels safely between jobs on crotch. Set-up is simplicity itself; the operator simply lowers outriggers, raises mast and attaches drill pipe and bit.

Actually, adding to the drill string takes *less* than five minutes with the Schramm Truck Mounted Rotadrill. One man does the job without delay or danger.

Big reason is that controls for breaking pipe joints are located near the mast—along with controls for starting, stopping, rotation, down pressure and rapid traverse. Also, there's no rotating table or Kelly bar. Fast vertical action of rotative head serves as pipe hoist for adding pipe or pulling drill string. Slip holders open easily for setting of casing and enough pipe is carried on the rig to drill a well.

Truck Mounted Rotadrill sets up for work in minutes—makes hole faster than any other type of drill rig. Rotary air drilling, with the Schramm Rotadrill, means 600% to 700% faster penetration. Because compressed air continuously cleans the hole, the drill bit works on new rock instead of regrinding chips.

With 26,000 pounds down pressure, the Rotadrill can drill a 6¼" hole with 4½" O.D. pipe to a depth of 700 feet. Under certain conditions, larger holes can be drilled with a 4½" O.D. pipe. With a smaller drill pipe, smaller holes can be drilled to 1500 feet.

Full cost-cutting details of Schramm Truck Mounted Rotadrill are yours without obligation. Write for Bulletin TMR-55 and ask for "Rotary Rock Drilling with Schramm Air Compressors."

Your local Schramm Dealer is listed in the Yellow Pages of your telephone directory.

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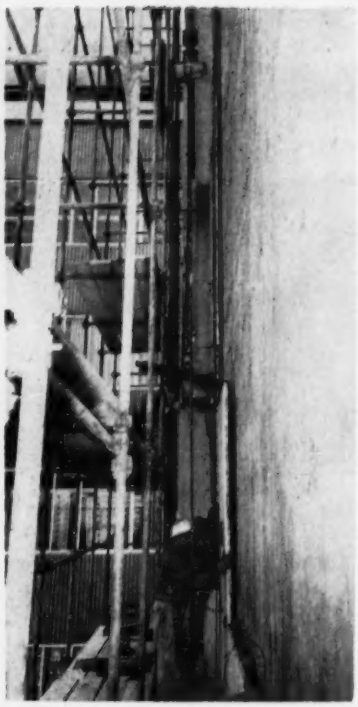

ELECTRIC HOIST positions cast stone wall panel while workmen push it into place.

Monorail

IF YOU EVER have to place cast stone wall panels on multi-story buildings, then, here's a contractor-developed monorail lift system for placing the panels and grouting behind them that can save you plenty in handling time.

It features two electric hoists that ride suspended from a monorail. The rail hangs from outriggers that are mounted on tubular steel scaffolding around the building.

California contractor A. H. Maxted, Inc., developed the method to lift and place wall panels and to grout by lift bucket behind them for an 11-story addition to the Prudential Insurance Co. Building in Los Angeles.

The idea came about because of a serious problem that faced Maxted when he began the job. Two of the addition's three walls were of solid concrete. This ruled out the normal use of cranes for the lifting and placing of panels. Panels might be lost from swinging them in against the wall. Maxted

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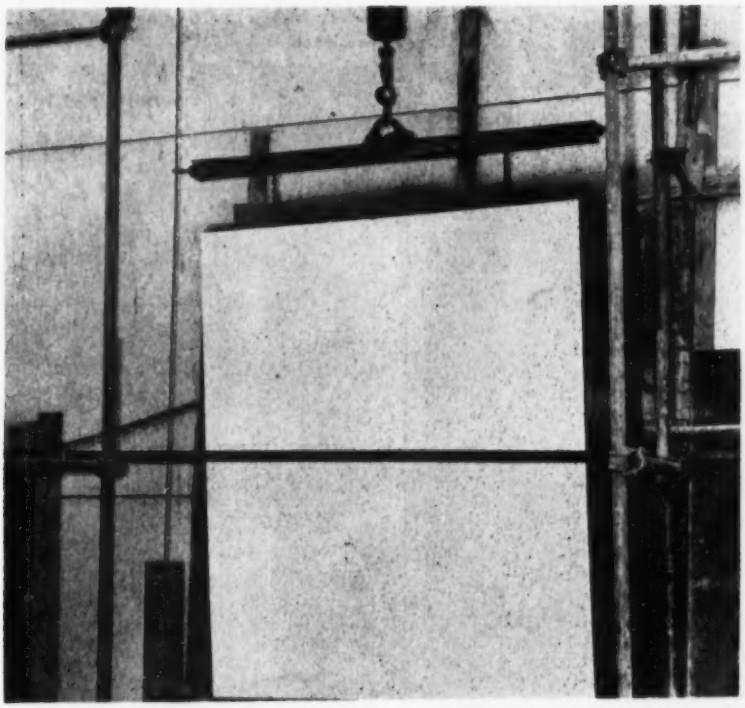
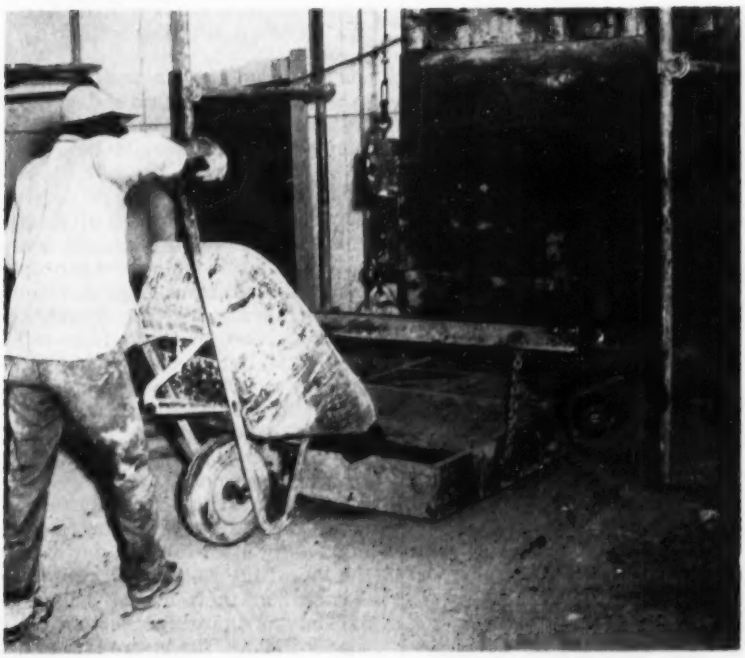


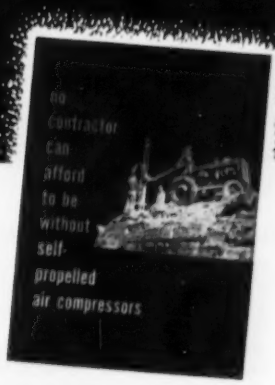
PANEL STARTS its ride to monorail height. Loops at each end of beam circle guide cables that position panel. System solved problem of placing panels on 11-story building.

Carries Wall Panels



WORKMAN LOADS grout bucket specially designed for filling-in behind panels. Bucket rides to monorail height and is handled by hoist in the same manner as the precast panels.

no contractor can afford to be without self-propelled air compressors



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"PORTO-POWER" REMOTE CONTROL HYDRAULIC JACKS — like a human hand — apply tons of force where needed to push, pull, press, bend, spread, clamp!

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MONORAIL . . .
continued

NOZZLE FITTED to bottom of bucket feeds grout behind panels until voids are filled.

had to find a way to position the panels with a minimum of jockeying and breakage. That's how the monorail system came to be.

Erection Procedure

The contractor first sets up rigid Tube-Lox scaffolding around the building's perimeter and to the top floor. Scaffolding is kept about 4 ft out from the building facade.

An 8-in. Cleveland tram-rail next is set temporarily on the ground around the perimeter of the building between facade and scaffold. The rail has a special curved section that enables it to go around corners.

Ratchet drums—normally used to raise and lower hanging scaffolds—are fitted upside down to the top of the rail on 7-ft centers. A cable runs up from each drum to 4x6-in. wood outriggers set on top the scaffold. These are secured between top cross bars of the tubular frames.

The rail then is hoisted upward to a position above the level of the first tier of precast panels. Two electric hoists are attached by rollers to the underside of the rail. These are push-button operated. The hoists position the panels and move them horizontally along the rail but they do not do the actual lifting of the panels from the ground. This lifting is done by a 25-hp, single-drum gas hoist set on the ground.

Lifting Procedure

Panels measure approximately 6x7 ft. They are delivered to the hoisting area from the yard by a 4,000-lb capacity fork-lift truck. Each panel then is secured to the lifting hoist cable. This is fitted with a special bridle and cable device to keep the panel from banging against the wall. The hoist then lifts the panel to near monorail height.

The electric hoists then take over. Each panel is fitted with two lifting rings. After a panel has been lifted, a cable attached to one of the electric hoists engages a second ring freeing the panel from the lift cable. The panel then is rolled suspended on the cable along the monorail to position. Workmen there push the panel into place against the wall. An entire tier is placed in this way.

Grouting Behind Panels

Maxted's ingenuity resulted in some time-saving on this important phase of panel erection, too. Maxted developed a grout bucket that is handled with the same devices used for lifting and placing panels.

The bucket is flat in shape and also is fitted with dual lifting rings. It lies flat on the ground until filled with grout by wheelbarrow. The gas-powered hoist lifts the buckets to monorail height where the electric hoists pick it up and carry it to the panel to be grouted.

A special nozzle fitted to the underside of the bucket feeds grout behind the panel until all voids have been filled.

A. H. Maxted, Inc., is masonry contractor on the Prudential Building. General contractor is William Simpson Construction Co. of Los Angeles. Panels were manufactured and delivered by C. D. Wailes Co. of Los Angeles. Architect is Welton Becket and Associates of Los Angeles.

Do it the easy way!

with powerful hydraulic Porto-Power

● There's a fast, low-cost answer to scores of on-the-job time-consuming construction problems. Use tons of hydraulic power to do the work! Apply force quickly . . . and exactly where needed with remotely controlled all-directional Blackhawk "Porto-Power" hydraulic jacks!

The men above, for example, do it the easy way — leveling up the cantilever section of a lift slab with "Porto-Power" ram and gauge-equipped hydraulic hand pump.

Put Blackhawk hydraulics to work for you — on 1001 jobs! Only Blackhawk offers you such a broad choice . . . the world's most *complete line* of 103 *basic* hydraulic power tools!

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416 hp pusher loads 25-yd. Tournapull® in 40 sec.

The construction industry's most powerful rubber-tired pusher, the 416 hp LeTourneau-Westinghouse Twin-C*, set records for speed, mobility, and power recently when it worked with 2 big 25-yd. Model B Tournapulls on an 840,000-yard grading job for Nick Pinello of Colorado Springs. The job involved leveling the site of a new shopping center in a suburb south of the city. On this contract, scrapers moved tight shale and clay, with some gravel — checked at 15% in-place moisture, on the average.

Pinello had L-W scrapers in two other work teams on the project. Four 18-yd. self-propelled C Tournapulls were push-loaded by a crawler as were three crawler-drawn 23-yd. scrapers. (Chart shows performance of all teams.)

TOTALS OF TEAM PERFORMANCE

Here are team figures for one 9-hr. day's production of all scrapers and pushers on Pinello's spread:

Team 1: 2 B Tournapulls (25-yd.) with Twin-C Pusher.

Cycle time	3 min.
Trips per hr.	16
Average load	20 yds.
Hourly output per "B"	320 yds.
One-Way haul	1,200'
Load	40 sec.
Haul	60 sec.
Dump	20 sec.
Return	60 sec.
Cycle time	3 min.
Team daily total	5,000 yds.
Output per scraper:	*2,500 yds.*
1,200' haul	

Team 2: 4 C Tournapulls (18-yd.) with two 190 hp crawler-tractor pushers.

Cycle time	3 min.
Trips per hr.	16
Average load	12 yds.
Hourly output per "C"	192 yds.
Approximately same haul and cycle time as Team 1	
Team daily total	6,000 yds.
Output per scraper:	*1,500 yds.*
1,200' haul	

Team 3: 3 Scrapers (23-yd.) drawn by 190 hp crawler-tractors with a 190 hp crawler-tractor pusher.

One-Way haul	750'
Team daily total	3,000 yds.
Output per scraper:	*1,000 yds.*
750' haul	

With powerful 416 hp dual-engined Twin-C behind the big 25-yard "B's", each Tournapull was heaped with material in less than 40 sec.

Twin-C's air-actuated, constant-mesh transmissions, with torque converters, drive 40-ton pusher at speeds up to 20 mph. Work records show it could easily handle up to 4 big scrapers working on ½-mi. round-trip hauls.

Production for all teams averaged over 14,000. yds. in an 8-hour day. When "B" and "C" teams worked shorter than average hauls (1,200'), they moved 18,000 yds. Pinello finished 30 days ahead of schedule, without working his machines to capacity.

Tires compacted spread material

The operation was a balanced cut and fill job. Maximum cut was 45', maximum fill, 30'. Soil was fairly tight. With big tires on scrapers aiding compaction, and sheep's foot roller doing final compacting, Pinello had no trouble getting 90% Proctor density.

Production on steady level

Pinello ran this 840,000-yd. grading job with the precision of an 8-day clock. Production was good and steady, above average at all times.

(Advertisement)

When Twin-C push-loads this big B Tournapull, a total of 709 hp is concentrated in forward thrust. Machines shown here were among 10 L-W units used by Nick Pinello in moving 840,000 yds. for a new shopping center near Colorado Springs, Colo. Twin-C and 2 "B's" worked as a team. Loading time in tight shale-clay-gravel was only 40 secs.

Hauling to fill, B Tournapull takes advantage of high speed. Rig completed ½-mi. cycle in 3 min. Bank at right is part of fill. At this stage, material moved by Pinello's scrapers was used to dress edge of fill.

An Adams heavy-duty grader was used by Pinello for haul-road maintenance and leveling of fill area. High-speed grader was able to keep up with production of three "B's", four "C's", and three L-W tractor-drawn scrapers.

According to Pinello: "That's all I want — good *steady* production. I keep my scrapers rolling at 14 miles per hour, even though they could double that on the straightaway. Excessive highballing costs a contractor money. Repair costs go up, and so does downtime. At the end of the job, the profit column reads zero."

"Machines are money-makers"

Pinello is proud of his men and his machines. "Today's machines are money-makers," he says. "I like the 'Pulls of course, that's why I got 'em. The all-electric controls are fast, and safe. The machine is easier to maneuver with electric controls. Maintenance is low, and repair is a snap."

Nick Pinello gives each of his operators a strong sense of responsibility for controlling operating cost of rigs, by having them handle their own servicing and repair work at end of shift. According to Pinello, "Any operator on my job can tear 'em down and fix 'em." This unusual feature of Pinello's operation pays off.

Pinello doesn't believe that racing his rigs pays off. He doesn't want operator to "give-it-the-gun", trying to lap another operator. He doesn't want his machines sidelined for costly repair work. He educates his operators to go after the steady *profitable* production.

Men, machines well managed

Besides good men and good machines, a third factor deserves credit for Pinello's success in business. Third profit producer on all his jobs is Pinello's own good management of men and machines. He schedules a precision timetable to get maximum team output and insists that all units roll on schedule all day long, every working day.

Investigate the new 27-yd. "B" Fullpak* Scraper and the 18-yd. "C" Tournapulls for your production dirt-moving. And, for that faster loading, check the 416 hp Twin-C Pusher. Call or write for detailed information.

*Trademark F-1298-H

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Left: New 3- and 4-ton Load King. Other new capacities: 5, 6, 8, 10 and 12 tons. Popular low-capacity Load Kings range from ½ to 2 tons.

FREE

3-color "Why" booklet shows Yale Load King engineering details in dramatic sectional views. For your free copy, write to The Yale & Towne Manufacturing Co., Philadelphia 15, Pa., Dept. A-334.

UP TO 95%

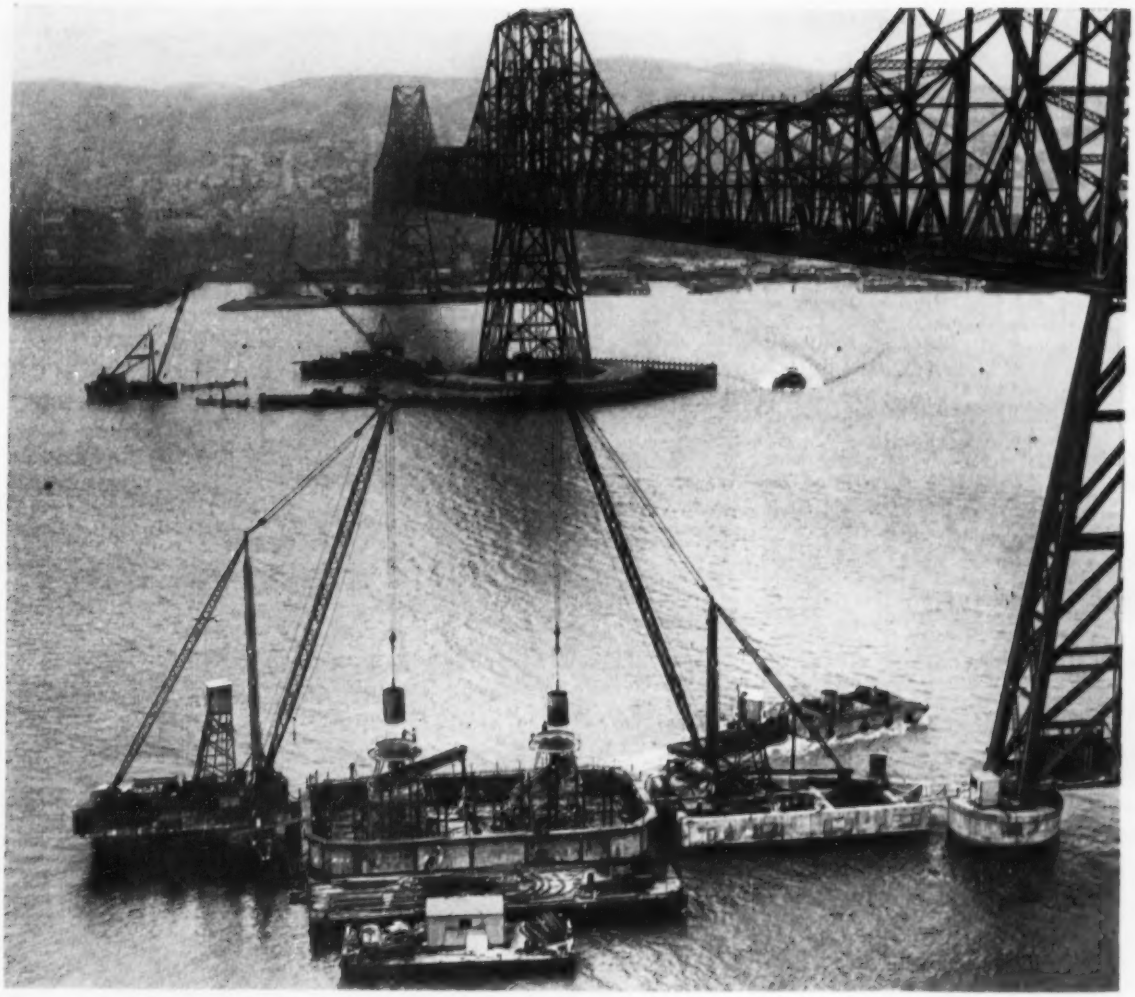
EFFICIENCY! NEW CAPACITIES TO 12 TONS!

Yale Load King Hand Hoists are now available in new *high* capacities—completing the line of Load Kings famous throughout industry for extremely high mechanical efficiencies. Every hoist in this extended line has ball bearings on all rotating shafts to keep friction loss low. All parts are precision-tooled from light, high-strength alloy metals, making these hoists speedy, rugged, easy to use and carry. The Synchromatic Load Brake, another achievement of Yale research, applies instant, automatic, safe-hold brake action between pulls. For booklet of full facts, see box at left.

YALE* **INDUSTRIAL LIFT TRUCKS AND HOISTS**

*REG. U. S. PAT. OFF.

Gasoline, Electric & LP-Gas Industrial Lift Trucks • Worksavers Warehousers • Hand Trucks • Hand and Electric Hoists



Builders of new San Francisco Bay Bridge have a slick system for . . .

Sinking Caissons in Deep Water

A CLEVER TEAM of substructure contractors for the new $23-million Carquinez Bridge across San Francisco Bay are writing a new chapter on the art of sinking big, open caissons through 90 ft of swirling tidal currents and 45-ft of mud, sand, and gravel to bedrock. On their job:

- Hydraulic monitors and airlift pumps remove soft bottom material.
- Precast concrete panels serve as exterior wall forms—then become part of the completed caisson walls.
- Concrete distributors reach out 30 ft and rotate through 360 deg to feed concrete for the "egg crate" caisson walls.
- Shaped charges blast out hard bedrock.

The foundations will support the new cantilever crossing of Carquinez Straits, an arm of San Francisco Bay about 40 miles northeast of the city. The new bridge will parallel an existing structure. And, like the old bridge, it will have two 1,100-ft cantilever spans, two 500-ft side spans, and a 150-ft mid-crossing tower span. Holder of the $5.5-million substructure contract is a joint venture of Mason & Hanger-Silas Mason Co., Inc., and F. S. Rolandi, Jr., Inc.

The job includes three identical open caissons, each 53 ft wide and 102½ ft long. One caisson will support the north tower; the other two will support the center tower. The south tower is being built on a pier constructed inside a sheet pile cofferdam. It is in much shallower water than the north and center towers.

The north tower caisson has reached bedrock. And work is well along on concreting one of the two mid-crossing caissons. For all three caissons, procedure will follow closely the pattern established on the first.

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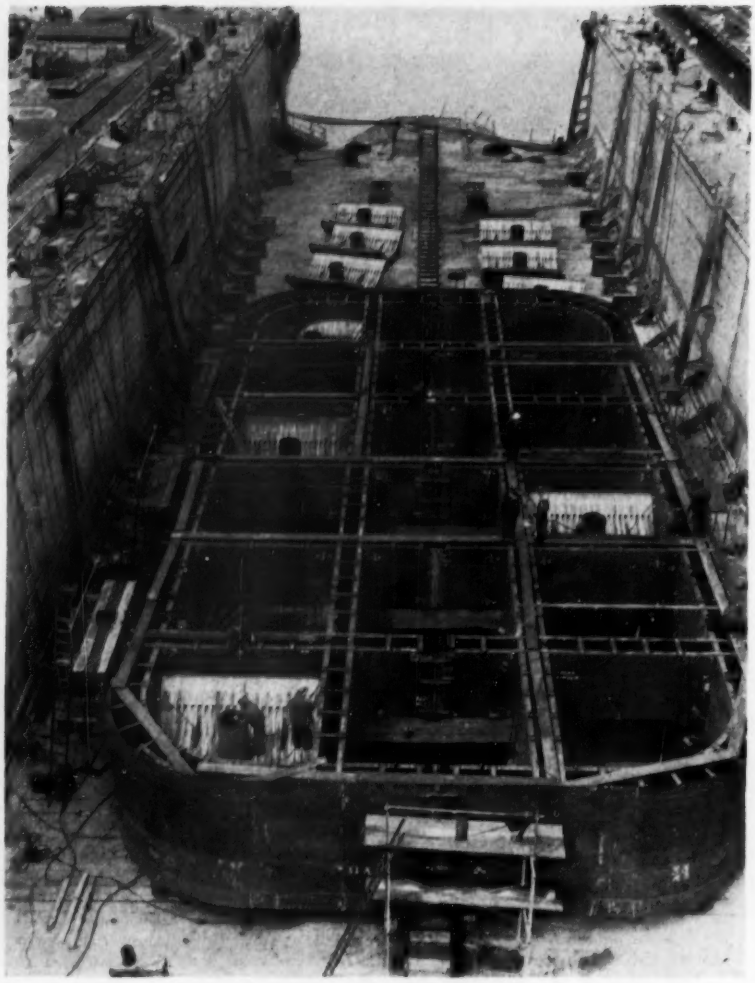
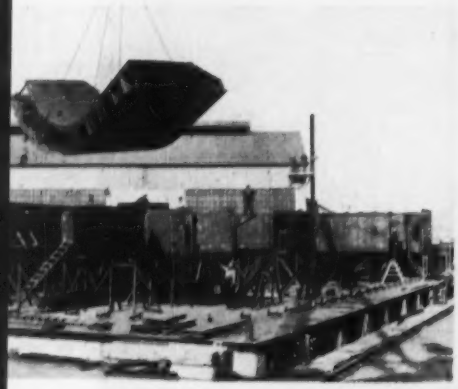


CUTTING EDGE of heavy steel plate is 12 ft deep and fitted with false bottoms of laminated timber in each of its 18 cells.



SECTION of cutting edge of caisson is lowered into position on fabricating pallet.

Construction of Caisson

The big Carquinez caissons have 18 interior cells each 14 ft square. Each cell is sealed by a false bottom that is an inverted dome of laminated timbers. A steel pipe dredging well 30 in. in dia projects through each timber seal to give access to the underpart of the caisson.

The bottom 12 ft of the caisson is a steel cutting-edge assembly; the rest of the caisson is concrete. Interior walls are 30 in. thick, and exterior walls are 3 ft thick.

Mason-Hanger-Rolandi subcontracted fabrication of the initial portions of the caissons to the shipbuilding division of Bethlehem Pacific Coast Steel Corp. Bethlehem assembled the cutting-edge in a floating drydock at its San Francisco shipyard and added 20 ft of concrete wall—half solid concrete and half 4-in.-thick wall panels—to provide sufficient freeboard for the tow to Carquinez. The initial assembly weighed about 1,600 tons. Afloat, it drew 15 ft of water and had 17 ft of freeboard.

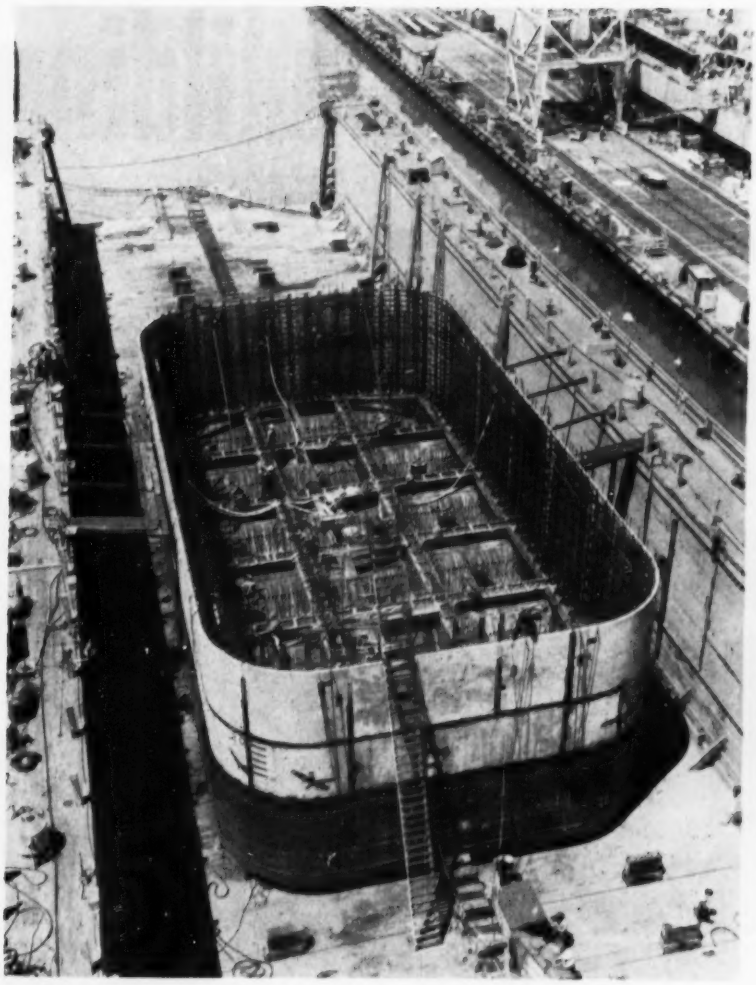
Positioning

Before positioning the caisson at the bridge site, the contractor drove 24-in.-dia steel pipe piles to support working platforms. Some of these piles later will be incorporated into the fender system.

Construction of these working platforms turned out to be a complex task because the piles are as much as 150 ft long and the variable tidal currents in Carquinez Straits are tricky. At certain velocities, the vortex of the current was found to have the same vibration as the natural period of the pipe. This caused the pile to vibrate excessively, and the contractor had to make sure that there would not be resonant vibrations at any of the various current velocities.

To guard against excessive vibration, substantial diagonal bracing of the pipe piles was required. In addition, the contractor found it necessary to run snubber cables from the working platforms to the submerged concrete anchors that hold the caisson in position at the bridge site.

For the north caisson, 16 concrete anchors weighing 25 tons each were buried in the bottom. The contractor had planned to jet the anchors down into the silty bot-



CONCRETE PANELS 4 in. thick are placed to a height of 20 ft above cutting edge. Joints are sealed with fibrous glass tape.

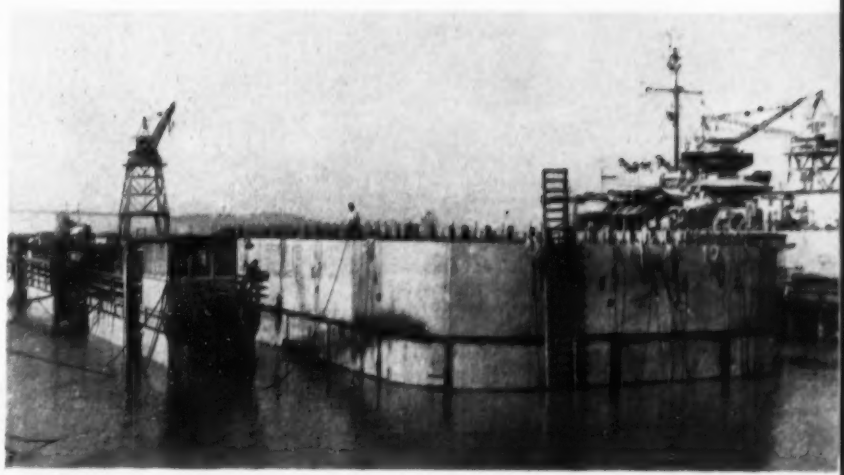
DREDGE WELL in bottom of each cell provides access for airlift and jetting equipment.

Begins in Drydock

tom formation with seven firehose nozzles on the bottom of the anchors through which water at 300 psi was forced. But in some places the bottom formation proved too stiff to be moved by the jets, and a big airlift was needed to get the anchors into place. In a few spots, the bottom was too hard even for the airlift to penetrate. There the contractor sank old barges on top of the anchors to hold them in place.

Cables from the anchors run through sheaves near the bottom of the caisson and are connected to the caisson near its top. This top connection is moved up as the caisson walls are built up. The two-point attachment affords positive control.

continued on page 168



AFLOAT at the drydock, the caisson weighs 1,600 tons, draws 15 ft of water, and has 17 ft of freeboard. It will be towed to the bridge site and anchored in position.

To speed road-building

Gar Wood Dozecasters are matched to the most powerful tractor of them all . . . the Euclid TC-12. A rugged C-frame supplies maximum rigidity against bending or distortion. Screw-type thrust arms provide easy adjustment . . . are attached with "deep anchored" lugs that can't bend or smash. Heavy-duty swivel bearing lets one man angle blade. Gar Wood cable-control units offer quick, accurate control of the 18-ft. Dozecaster moldboard.

On Gar Wood 75's, independent travel is one of many features that speed production. Operator can hoist or swing while moving. Worm-driven boom hoist with spring-loaded brake permits fast hoisting with complete safety. Production is further speeded by ease of maintenance of the compact machinery deck . . . the 75B gets back to work faster. It's built by specialists in ¾ yard excavators!

GAR WOOD

PLANTS IN WAYNE AND

from clearing to concrete-

go GarWood

During the next ten years, speed will be of primary importance if production is to keep pace with proposed schedules of the new highway program. Where work on segments of this program is already under way, Gar Wood equipment is proving its ability to speed production, from clearing to concrete!

With Gar Wood equipment, production is faster because of advanced design. Component parts function with that degree of efficiency needed for fast, steady production. Find out how you can go Gar Wood "all the way." Call your Gar Wood dealer, or write direct to: Customer Service Department, Gar Wood Industries, Inc., Wayne, Mich.

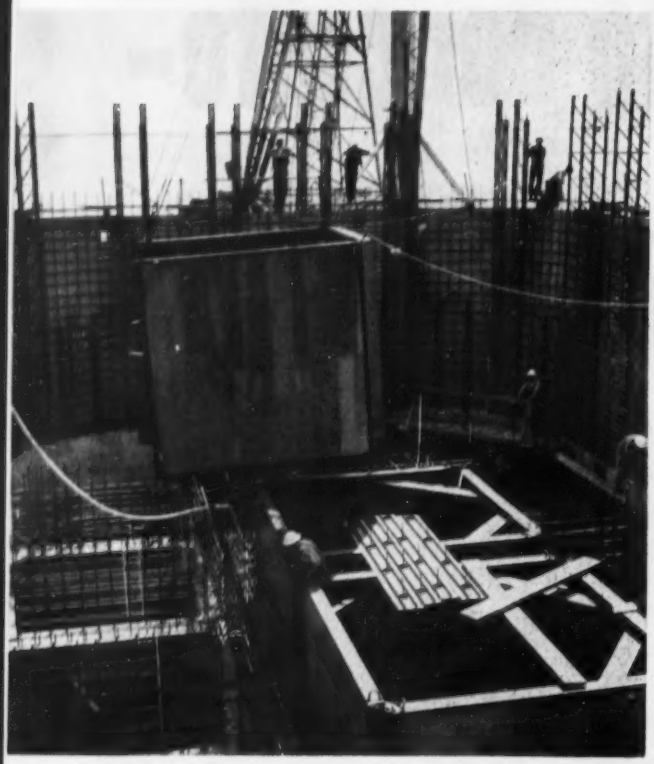
Gar Wood - St. Paul dump bodies are structurally stronger at all critical stress points . . . built to take the punishment of shock loading. Matched with "Strong-Arm" hoists, they offer the smoothest, most dependable team on the market. "Strong-Arm" design eliminates one-sided lifting strains. Dumping is fast, safe . . . even on steep slopes!

Gar Wood - Buckeye finegraders can finish 100 feet of 25-foot cross-section per hour in the toughest conditions. Many users report 400-foot-per-hour production in ideal conditions. Power for extra-tough cuts is supplied by positive, non-slip chain drive. Hardened steel cutting-teeth offer long life. Power reverse and hydraulic lift save valuable production time.

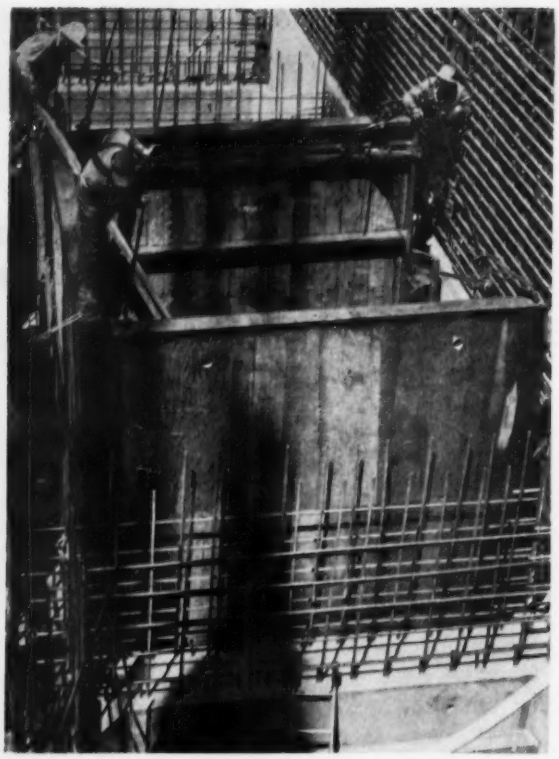
INDUSTRIES, INC. Wayne, Michigan

YPSILANTI, MICH.; FINDLAY, OHIO; MATTOON, Ill.; RICHMOND, CALIF.

SAN FRANCISCO BRIDGE . . . continued from page 165



FORM for caisson cell is plywood-faced, steel-framed assembly 12 ft high. Each of these forms can be reused 13 or 14 times.



CONNECTION between pours is made by running steel pins through holes in the form and into tapered holes cast in the concrete.

SCREWJACKS at inside corners position form and retract it enough for stripping.

Screwjacks in Corners Adjust Box Forms for Cells

When the caisson is anchored securely in position, the contractor begins to build up its concrete walls to add weight and sink it through 90 ft of water to bottom.

Forms for caisson cells are plywood - faced, steel - supported assemblies in the shape of boxes 12 ft high. Each wall pour is a 10-ft lift, so the 12-ft height of the form provides a 2-ft overlap for fastening the new pour to the wall.

Screwjacks at the corners collapse and expand the form assemblies to facilitate placing and removing the forms. The plywood face has a glass plastic coating that permits the forms to be reused 13 or 14 times—the number of pours required for the walls of one caisson. No form oil is used.

The precast concrete panels that serve as exterior wall forms are a feature of the concreting operation. The panels offer several advantages. They act as outside forms, replacing awkward and hard-to-handle forming methods; no finishing or patching of the exterior walls is necessary; and the panels form a watertight shell that temporarily increases the flotation qualities of the caisson. This is important in towing the caisson to the site as well as during positioning and sinking.

The panels are supported by small structural steel trusses cantilevered up from the previously poured concrete. These trusses also serve as part of the wall reinforcing.

Joints between panels are sealed by a 6-in. width of fibrous glass tape coated with a thick plastic paint. The tape forms a bond with the concrete so strong that the panel would break under pressure before the joint.

continued on page 170

"Armco MULTI-PLATE Pipe is easy to install"

In foreground is Mr. Edward B. Copas, directing assembly of double Armco MULTI-PLATE Pipe-Arch at Eldean Road site.

So said Mr. Edward B. Copas, Construction Superintendent for D. R. Smalley & Sons, Inc., contractors of Celina, Ohio.

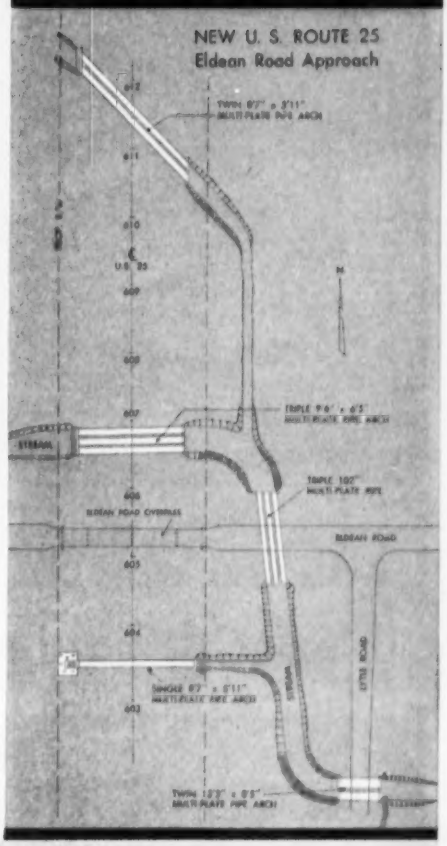
He was directing the assembly of five different Armco MULTI-PLATE® Structures used to solve a difficult drainage problem at a road overpass near Troy, Ohio. This part of the relocation of Route 25, in Ohio is under contract to D. R. Smalley & Sons, Inc. (Map shows details of the site.)

All design work and supervision of construction on the Route 25 project is handled by the Ohio Department of Highways.

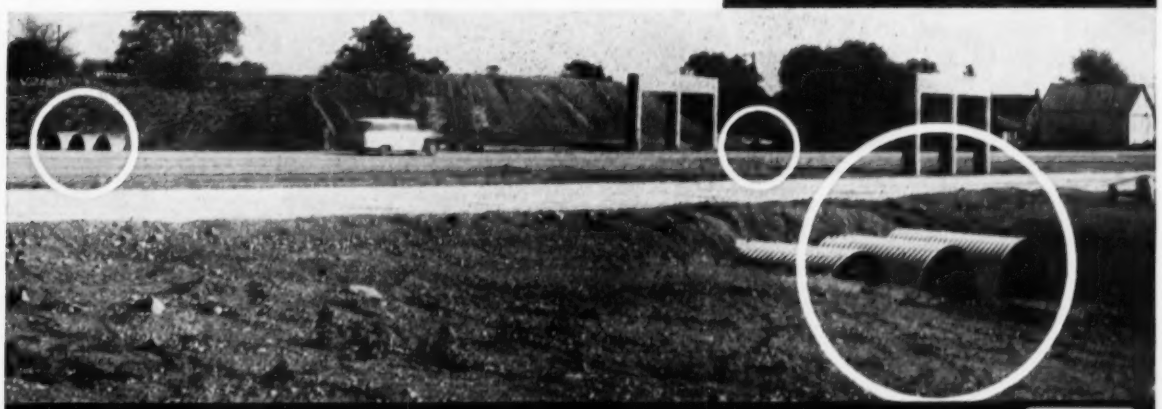
* * * * * *

Contractors all over the country are installing Armco MULTI-PLATE Pipe, Arch and Pipe-Arch on major expressways as well as secondary roads. Work goes quickly—no curing before backfilling. Wide range of sizes and gages.

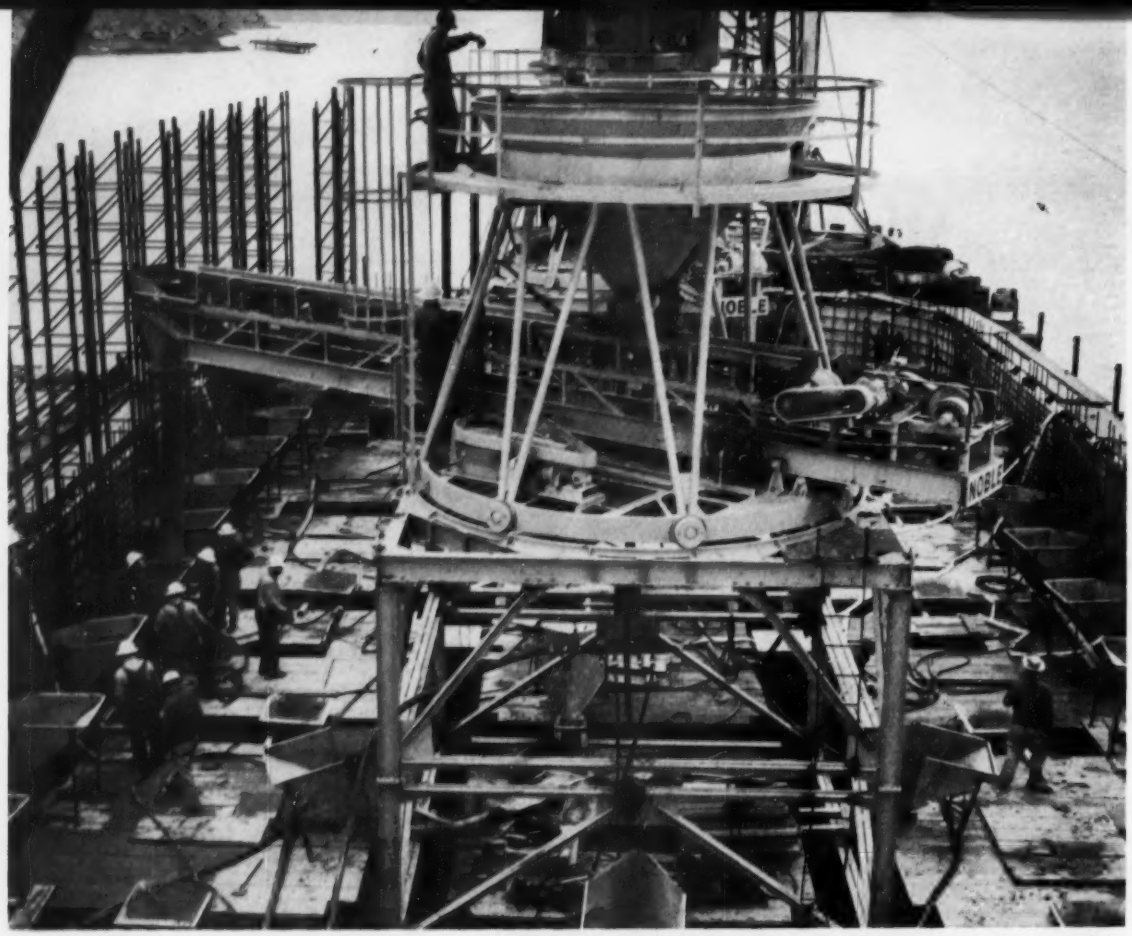
Write for data on Armco MULTI-PLATE Structures, Armco Corrugated Metal Pipe, Armco FLEX-BEAM® Guardrail, Armco Pipe Piles and other products for highway construction. Armco Drainage & Metal Products, Inc., 4077 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



This photo shows three of the five Armco MULTI-PLATE Structures at the Eldean Road approach on Ohio's new Route 25. At left is triple line of pipe; at right is triple line of pipe-arch; and in background is double pipe-arch carrying drainage of the other four structures.



ARMCO MULTI-PLATE DRAINAGE STRUCTURES



UNIQUE DISTRIBUTOR, built by Noble, places concrete in forms. Derricks dump buckets into hopper that feeds onto a conveyor belt through air-operated gates. Speed of concreting is controlled by the hopper gate opening and by conveyor belt speed.

SAN FRANCISCO BRIDGE . . . continued

Special Equipment Delivers Concrete

BARGE delivers concrete buckets from mixing plant on shore to caisson. Three of these barges were custom built for this job. Each hauls six 4-yd buckets of concrete and has two empty compartments to pick up empty buckets left suspended on derricks.

A pair of unique air-powered distributors feed concrete into the caisson walls. Each of these distributors can be rotated through 360 deg and has a conveyor belt with a maximum reach of 30 ft.

A 20-ton derrick feeds each distributor. Concrete buckets are dumped into 9 cu yd hoppers that feed the conveyor belts through air-operated gates. The 36-in. wide conveyor belts discharge into nylon cord, vinyl plastic coated elephant trunks. Speed of concreting is controlled by the hopper gate opening and by the conveyor belt speed. When form moving operations are in progress, the 36,000-lb distributor assemblies are set on an adjacent barge.

Most of the equipment used in construction of the caissons is electrically driven to minimize the need to haul fuel out from the shore. The contractor brought a 2,300-v power cable out to the caisson area over the parallel existing bridge. Air power for the concrete distributors comes from a 650-cfm compressor driven by an electric motor.

Three barges carry concrete to the job. Each of the barges has eight special compartments for concrete buckets. It hauls six 4-cu-yd buckets filled with only 3 cu yd of concrete for fast handling and has two empty compartments to pick up the two empty buckets left suspended on the derricks when the previous barge returned to refill.

Mason-Hanger-Rolandi operate a concrete batching plant on the south shore. The plant has two 3-cu-yd mixers and is capable of producing 120 cu yd per hr. Mix time is 2 min, and the plant can charge the six buckets on a barge in about 6 min. The plant has telescopic chutes that can be extended or retracted as the tide rises or falls.

The batch plant has aggregates capacity in its bins for about 300 cu yd of concrete, and only limited space is available for aggregates stockpiles. The necessary additional storage capacity is provided by two rail sidings where enough aggregates for another 700 yd of concrete are stocked.

Each wall pour requires 690 cu yd of concrete. In actual operation, the contractor places about 90 yd per hr in the forms. This rate is controlled by the barge haul operations. Concreting is a one-shift operation, and a pour is made every fourth day.

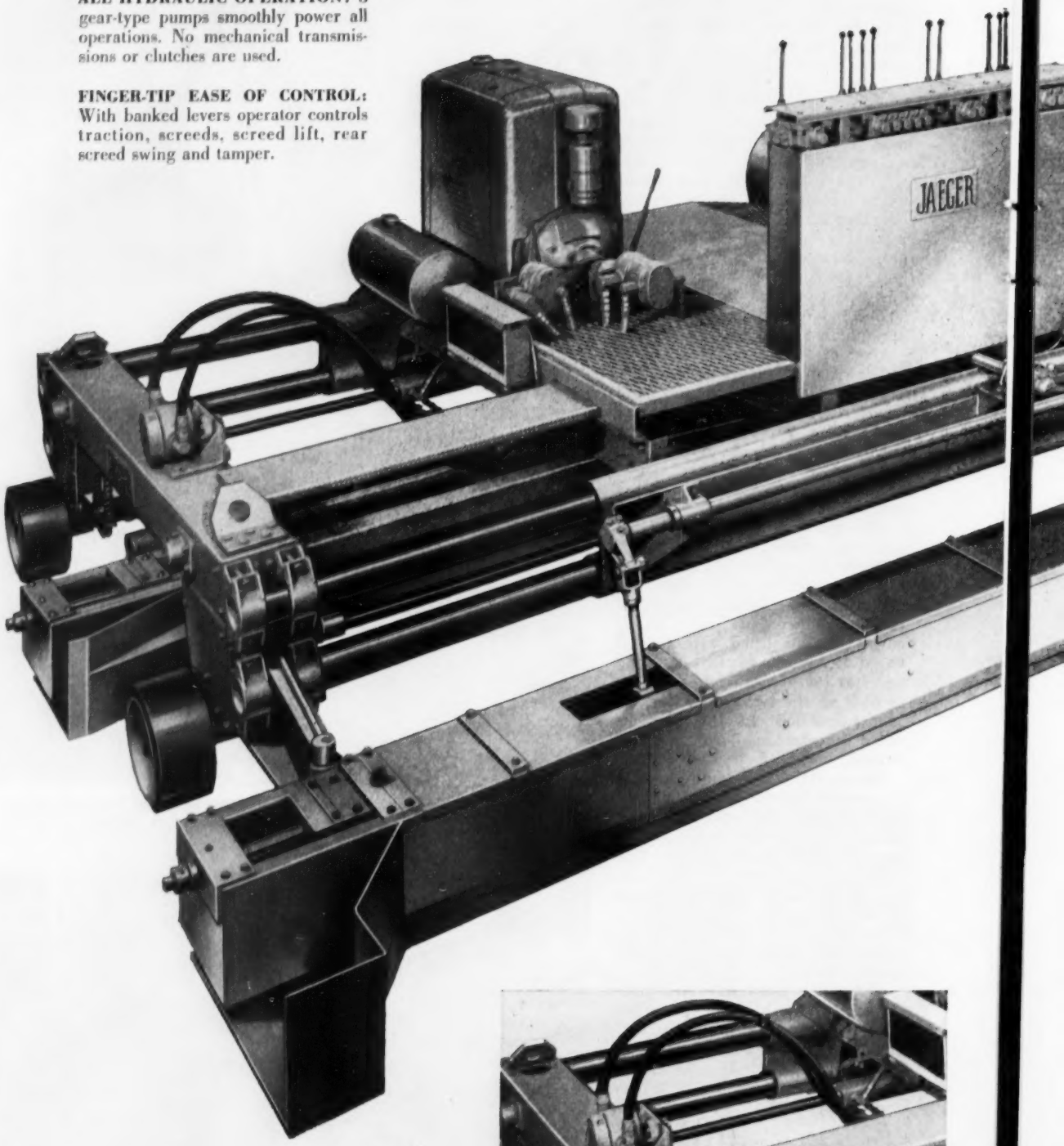
continued on page 174

CONCRETE PLANT on the south shore has Noble batching equipment, two 3-yd CMC mixers and telescopic chutes that can be retracted or extended as the tide rises or falls.

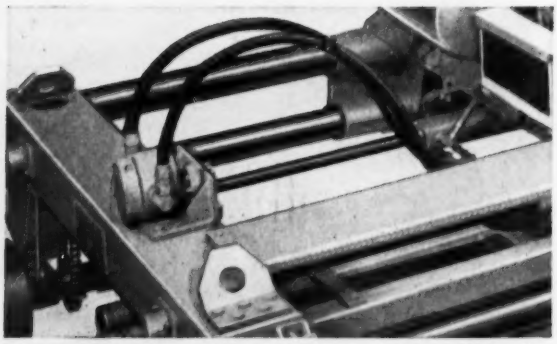
AGGREGATES, stored in hopper cars on railroad siding, are fed to bins at mixing plant by conveyor that starts in under-track tunnel. Car shaker is National Conveyor unit.

ALL HYDRAULIC OPERATION: 5 gear-type pumps smoothly power all operations. No mechanical transmissions or clutches are used.

FINGER-TIP EASE OF CONTROL: With banked levers operator controls traction, screeds, screed lift, rear screed swing and tamper.



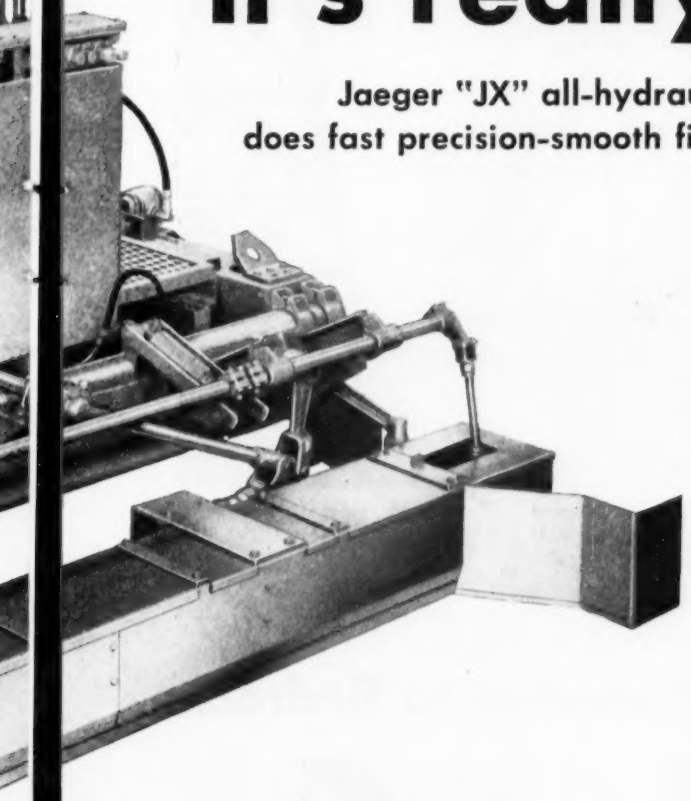
ONE MOVEMENT CHANGES SCREED CROWN: The quick turn of a lever uniformly raises or flattens entire screed to desired setting. Big advantage on curves.



6′ OF INFINITE WIDTH ADJUSTABILITY: Hydraulic power extends telescopic tubular frame any width up to 3′ on each side — 6′ total.

It's really *smooth*

Jaeger "JX" all-hydraulic self-widening finisher does fast precision-smooth finishing under finger-tip control



Everything is hydraulic. You make width changes up to 6′ and perform all travel and screed operations, including diagonal setting of the rear screed, with the touch of hydraulic levers. No mechanical transmissions or clutches. Even the tamper attachment and transportation wheels are hydraulically operated.

6′ of infinite width adjustability in each size: 12′-18′ **and 24′30′** standard widths; special widths from 9 to 30′ available.

Diagonal rear screed, hydraulically adjustable, lays material solidly against higher form on pitched slab and super-elevated curves. Quick crown change uniformly crowns entire screed with one lever movement. (Conventional screeds, including transverse rear screed, can be furnished if desired.)

Your choice of vibratory "bullnose" front screed or vibratory pan or tube attachments. Traction wheels for every condition.

The flexibility, speed and precision smoothness of the Jaeger "J" and "JX" finishers give you a big advantage on this year's work. See your Jaeger distributor, or write us, today, for complete information.

JAEGER

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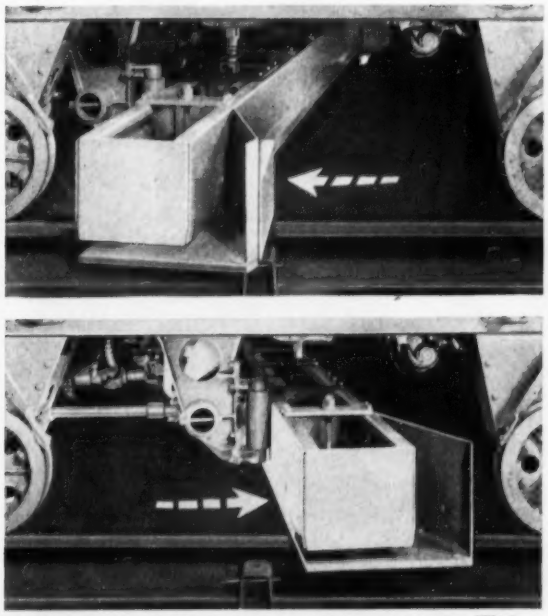
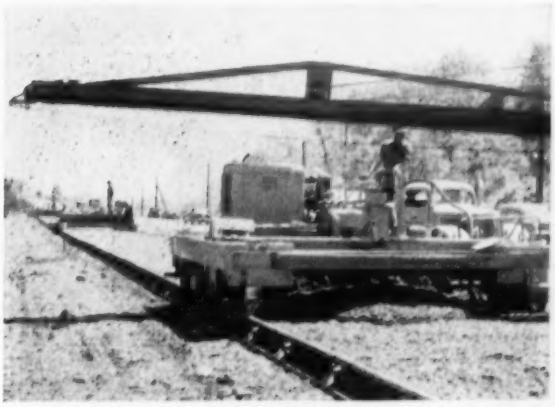
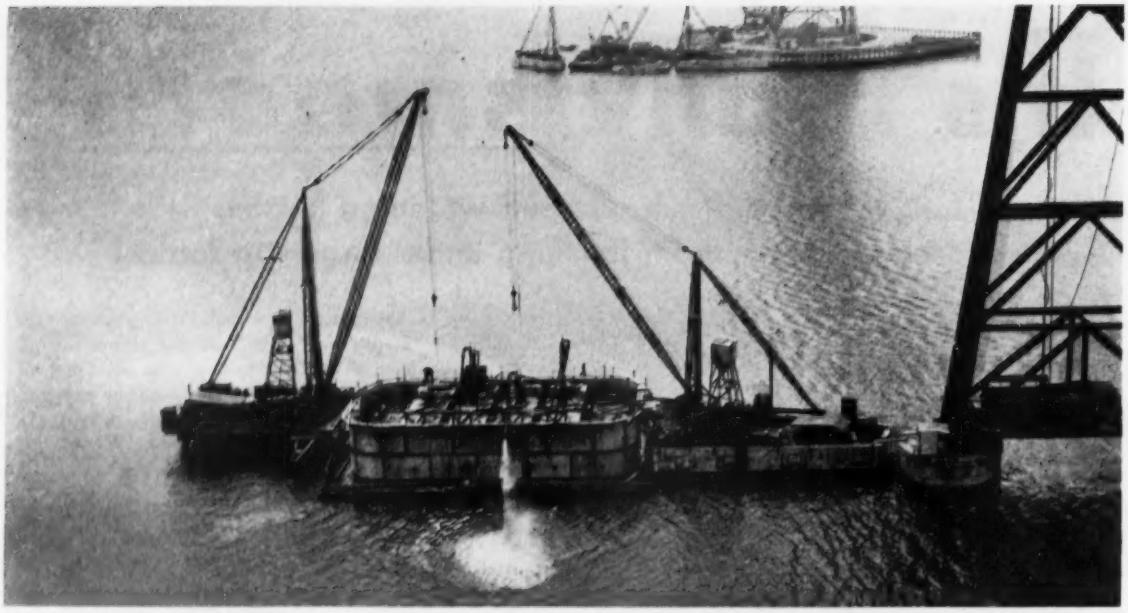
Jaeger Machine Co. of Canada, Ltd., St. Thomas, Ontario
Sales and Service in More Than 150 Cities of U.S. and Canada and Principal Cities of the World
SPREADERS • FINISHERS • AIR COMPRESSORS • PUMPS • CONCRETE MIXERS



HYDRAULIC POWER SETS SCREED ANGLE: With a light touch, operator swings rear screed to any angle needed for up-hill finishing on pitched slab or curves.



TEAMS BEST WITH JAEGER SPREADER: Screw-type spreader (with oscillating metering screed if desired) makes ideal combination for fast laying of slab.



MUDDY WATER pours from airlift discharge pipe. In the first week of operation after the caisson hit bottom, four teams of hydraulic monitors and airlifts removed enough bottom material to sink the caisson an additional 16.8 ft into underlying mud.

Monitors Sink Caissons to Bedrock

HORIZONTAL direction is handled by pushing lever that works through roller bearing assembly mounted on dredge well shaft.

VERTICAL adjustment of jet requires just a tug on shorter lever. Two 10-stage Peerless pumps provide water for monitors.

On the North caisson, concreting continued until the caisson penetrated well into the bottom mud of its own weight. Then the contractor removed the concreting equipment, set up the hydraulic monitors, and began excavating under the caisson.

In the first week, the jet excavating equipment sank the caisson an additional 16.8 ft. Then concreting was resumed to build up the walls to the point where they would be above water level when the caisson finally reached bedrock, and the jets sank the caisson another 14 ft.

The jets are similar to the hydraulic monitors used to sluice rockfill dams. Two 1,500-gpm pumps, capable of developing 350 psi, feed water through a 6-in. pipe to a 1½-in. nozzle mounted to permit directing the jet in any direction. The underwater stream is effective at a 30-ft radius.

Material is removed by 10-in.-dia airlift pipes. A 2½-in. pipe feeds the air supply to near the tip of the airlift, and a manifold insures even distribution of air around the circumference of the airlift pipe. Each airlift needs 400 cfm for successful operation. It develops a flow of 10 fps and is capable of moving a 2½-in. rock.

Both the jet and the airlift assemblies are mounted inside a 30-in. pipe attached to the dredging well in the false bottom of a caisson cell. Four of these assemblies accomplished all of the major excavation for the first caisson.

In operation, the jets are directed to move underlying materials from the edges to the center of the caisson. It takes a certain amount of skill on the part of the operator to keep the discharge as dirty as possible so that removal of material is at the maximum. In an easily moved formation, the caisson was sunk as much as 1 ft in an 8-hr shift.

With proper direction of the jets, it also is possible to maneuver the caisson a few inches in any direction. This is a help in meeting the tolerance—1 ft in 100 ft of caisson height—for final caisson location.

An advantage of the jetting operation is that the false bottoms in the caisson cells need not be removed until the caisson is very close to its final position. With the false bottoms in place, the caisson keeps a constant pressure of about five tons per sq ft on the material underlying it. And the pressure can be increased by partially flooding some caisson cells with water.

Maintaining this constant pressure on the bottom helps assure positive control of the caisson. Movement of the caisson can be controlled with maximum safety by using the jets to relieve the pressure gradually.

Blasting Bedrock

When the north caisson reached bedrock, the false bottoms in the caisson cells were broken out so that a clamshell could assist the jets and airlifts in removing bottom material. But first it was necessary to blast out some of the bedrock.

The rock at the bottom was very hard, and it sloped from north to south so that the north end of the caisson was about 4 ft higher than the south end. The contractor used shaped charges to break up this hard rock and lower the north end of the caisson.

The shaped charges are 6-in. lengths of 6-in. pipe capped at the upper end and packed with 6 to 7 lb of 60% Hercules Vibrogel gelatin dynamite. The explosive charge is shaped by a sheet metal cone placed in the bottom of the pipe with the open end of the cone down. The charge is packed between the sheet metal and the pipe.

The explosive wave of the shaped charge forms a directed jet that concentrates its force on the rock to be broken. Short legs hold the entire assembly up from the rock for better effect.

A diver placed the units, spacing them about 7 ft apart and taking care to keep charges 3 to 4 ft from the caisson walls to prevent damage to the caisson. Nine separate detonations of six charges each were needed to break up the hard bedrock.

With the bottom finally cleared, the contractor began pouring a tremie plug 25 to 30 ft thick. Steel roof decking material will be placed to form vertical bulkheads so that the pour can be made in three increments. The advantage of this is that the tremie pours will be limited to about 1,200 cu yd, and faster rise of the surface is expected to result in better quality tremie concrete.

continued on page 178

NOZZLE of Intelligiant monitor has universal joint to permit turning in any direction.

PIPE at right supplies water to jet, and pipe at left is airlift, fed by an airline.

New '57 Ford

Modern through and through

...to cost you less!

New Tilt Cab line offers six series from 18,000-lb. GVW to 60,000-lb. GCW. Up to 212 horsepower.

Modern with a purpose—that's the Ford truck story for '57. Modern through and through to give you high-efficiency performance that costs you less!

And, thanks to volume production, Ford trucks cost you less right from the start. New Ford Tilt Cabs—in addition to being America's most advanced line of Tilt Cabs—are the lowest-priced!*

Ford's tandem axle models are built from the ground up for extra-heavy-duty work. These husky trucks are rated to carry as much as 6,000 pounds more payload than other leading tandems with comparable specifications.

For durability, there's new toughness everywhere—in stronger frames, in sturdier axles, in higher-capacity springs . . . more reasons why *Ford trucks last longer than any other leading make.*

One look tells you—here's something new, really new, in trucks. For the *full* story on what they can do, contact your Ford Dealer today!

**Based on a comparison of factory-suggested list prices.*

FORD TRUCKS COST LESS

. . . LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

ONLY FORD GIVES YOU ALL THESE MODERN FEATURES

NEW Heavy Duty V-8 engines now have 4-barrel carburetion standard. Fresh-air intake with new thermostatic control optional on 302 and 332 V-8 engines. Dual exhausts also available.

NEW Styleside pickup bodies, standard at no extra cost. America's biggest pickup bodies! Built wider with all-steel rugged box section corner reinforcements and recessed taillights.

NEW riding comfort! A completely new chassis suspension, roomy cabs with increased visibility, greatly improved riding and handling ease.

NEW power advances! New higher horsepower, new freer breathing, new higher compression ratios, new Super-Filter air cleaner. New advancements from camshafts to carburetors.

NEW Driverized cabs—completely new—stronger, roomier, smarter! New wider full-wrap windshield. New inboard cab step, new Hi-Dri ventilation, new easy-to-read instrument panel!

NEW chassis strength! New frames, up to 13% stronger. New sturdier axles! New higher-capacity, easier-riding springs!

MAIL THIS COUPON TODAY!

FORD Division of FORD MOTOR COMPANY, P. O. Box 658: Dearborn, Michigan

Please send me the following truck model literature:

☐ CONVENTIONAL ☐ LIGHT DUTY ☐ TILT CAB ☐ MEDIUM DUTY ☐ TANDEM ☐ HEAVY DUTY

Name_____

Address_____

City_____ State_____

BRACING TRUSS for the south pier cofferdam is lowered into position by floating cranes. The 113-ton truss is mounted on 261 H-piles. It will brace two sets of wales that prevent collapse of the sheet piling when the cofferdam is excavated.

SAN FRANCISCO BRIDGE . . . continued from page 175

South Pier Built in a Cofferdam

The south pier—already completed—was built inside a 50x113-ft cofferdam. The contractor drove 14-in. H-piles through 50 ft of material to bedrock. A total of 261 piles were required. They were driven with telescopic underwater leads.

Mounted on the H-piles is a 113-ton cofferdam bracing truss. The truss was fabricated by Bethelem Pacific's Alameda yard and assembled on a barge. It was towed to the site and lifted into position by two floating cranes.

The truss braces two sets of wales that prevent collapse of the sheet piling when the cofferdam is excavated and unwatered. The wales also act as guides for driving 9x9-in., 38-lb, Z-shaped sheet piles.

After excavation of the inside of the cofferdam, a 5-ft gravel blanket was poured to insulate the bottom against concrete seepage. Then the cofferdam was tremie sealed to a depth of 12 ft, water was pumped out, exposed steel piling cut, and the reinforced concrete pier built up to a height of 16 ft above the water line.

Personnel

For the California Division of Highways, Leonard C. Hollister is project engineer on the Carquinez job, and Oscar Johnson is supervising resident engineer.

For the joint venture contractor, Russell G. Cone is project manager, F. S. Rolandi, Jr., is assistant project manager, L. L. Snedden is project engineer, and Ed Bowman is general superintendent.

Cone is a vice president of Mason & Hanger-Silas Mason Co., Inc., and was resident engineer on construction of the Golden Gate Bridge, a San Francisco landmark. Rolandi is president of F. S. Rolandi, Jr., Inc.

Among those who participated in planning the construction operations were R. L. Telford, executive vice president, Howard L. King, vice president and chief engineer, and Francis Donaldson, vice president, all of Mason & Hanger-Silas Mason Co.

PROJECT MANAGER Russell G. Cone (right) confers with Francis Donaldson (left), vice president of Mason & Hanger-Silas Mason Co., Inc., and L. L. Snedden, project engineer.

55% LESS KICK

with the NEW LE ROI shock-absorbing handle

The girl is Virginia DeLee, 5′ 8″, 124 lbs., 35-22-35

It's the hottest thing on rock drills yet! The new torsion rubber-cushioned handle on Le Roi sinkers cuts out 55% of all vibration normally delivered by air tools to the worker . . . yet doesn't lose an ounce of impact at the bit!

That means a lot less fatigue—higher output per day—bigger smiles at the end of the shift. And workers stay on the job longer when work is eased with better tools.

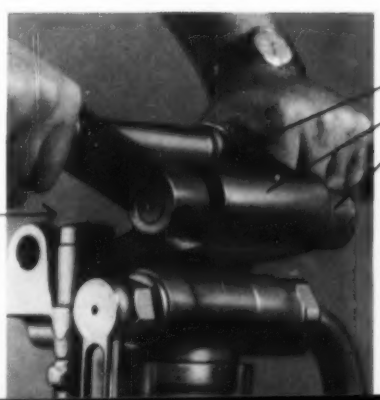
You get dependability, too. Like all Le Roi Newmatic Tools, the shock-absorbing handle is built for years of service life.

That's a lot of return for a low investment — see these new, new tools at your Le Roi distributor *now*. Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin

LE ROI NEWMATIC AIR TOOLS

a torsion rubber cushion in the handle – adjustable to suit the operator – dampens most vibrations.

55% of all tool-shock stops here!



. . . and you can wear a wrist-watch, too!

ITHO IN U.S.A.

Le Roi Model DR40 Wagon Drill for deep drilling, hard ground

Le Roi Model DR34 with H10 Drill for shallow drilling in average ground (also with H22 Drill for medium drilling in hard ground)

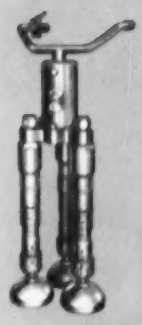
Le Roi Model H111 Heavy-duty Sinker for deep drilling, hard ground (55 lb.)

Le Roi Model H10 General purpose sinker for average ground (45 lb.)

Le Roi Model H11B Sinker for shallow drilling (35 lb.)

Le Roi Model 22 Sinker for utility work (17 lb.)

Le Roi Air Operated Sump Pump — capacities to 340 gpm, heads to 70 ft.



Le Roi Model BT11 Triple Hand Tamper for all applications

Le Roi Model 11 Single Hand Tamper for all applications

Le Roi Model C10 Demolition, light-duty Paving Breaker (35 lb.)

Le Roi Model 31 Clay Spade for average ground (18 lb.)

Le Roi Model C16B Clay Spade for hard ground (35 lb.)

Le Roi Model C11 General-purpose Paving Breaker (60 lb.)

Le Roi Model 52 Heavy-duty Paving Breaker for tough concrete (80 lb.)

BE EMPHATIC...

SAY LE ROI NEWMATIC!

A complete line of air tools for the construction industry... balanced for operator comfort... air-cushioned for long life... precision built for dependable operation.

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Milwaukee 1, Wisconsin

AT-1238

A MESSAGE TO AMERICAN INDUSTRY • ONE OF A SERIES

Can We Afford a $71.8 Billion Budget?

THE BUDGET submitted to Congress by President Eisenhower for the year beginning July 1 proposes federal spending of $71.8 billion. In only four years, three during World War II and one during the Korean War, has the government spent more. Under the proposed budget the government expects to collect $73.6 billion, mostly through individual and corporation income taxes.†

The principal reason for the size of the budget and for this year's increase is an expanding defense program. About 60% of all budget expenditures in the coming fiscal year will be for national security programs. Moreover, this area accounts for about 90% of the proposed increase in federal spending. In addition, as the chart shows, there are large expenditures proposed for purposes other than defense.

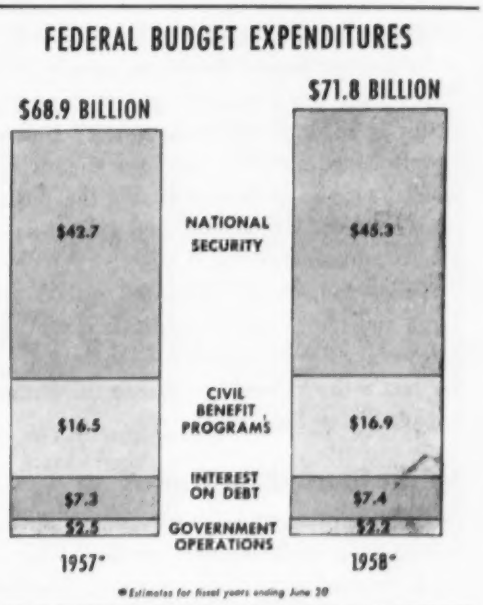
Continued budgets of this size, some contend, will lead to inflation and wreck our economy. It has been suggested that they might lead to "a depression that will curl your hair." Yet many insist that the budget, large as it is, still is inadequate in many respects — for defense, schools, agriculture, small business, health, research, indeed, for almost every activity in which the government has become involved.

Is It Really Too Big?

Actually, the proposed budget would place no greater burden on the economy than any budget in the last six years, because our economy has been growing. Federal spending per capita under the proposed budget will be about $416, or $10 more than this year; but our per capita income rose almost $80 last year. And, because of our increasing population, next year's expenditures will, in fact, amount to *less* per capita than in 1954 when federal spending was $4 billion lower.

Another way of measuring the burden of government expenditures on the economy is to compare the purchases of goods and services of all branches of government — federal, state and local — with the total output of the nation. The share of our national product taken by government this year will be about the same as in the past two years and, furthermore, about the same as the average for the past 28 years.

By the standard of any recent year, the budget is within the means of the American economy. In this sense, we can "afford" it. But the pros-



†*These figures refer to the regular federal budget and do not include operations of trust funds, primarily for social security programs and the new federal aid program for highways, which are financed by special taxes.*

pect of steadily increasing budgets, requiring 20% or more of our national income, introduces another threat.

The Real Threat

Large and rising budgets that do not balance government spending with higher tax collections clearly would be inflationary and would destroy the value of the savings and income of all who lagged in the race with climbing prices. But serious dangers will still exist even if our budget continues to be balanced, as this year's is.

- **Budgets that require a large take in taxes eat up the savings required to finance private industry.** What the taxpayers must give the government they cannot save. This deprives private industry of the savings and resources needed to expand and modernize producing facilities.
- **High tax rates also undermine the incentive to save and invest in normal business enterprises by taking such a large share of any income gained.** Taxes on corporation income now take 52% of all income over $25,000. And taxes on individual incomes can take as much as 90% of earnings that remain after this 52% bite.
- **High taxes encourage, on the part of both individuals and corporations, the search for "gimmicks" and special treatment.** As a leading character in Cameron Hawley's novel *Executive Suite* observed: "To a far greater degree than most people realize, income tax has become a primary governing factor in corporation management." Indeed, it is only because of the numerous gimmicks and special provisions now available that high tax rates have not already inflicted greater damage to economic incentives.

These dangers comprise the real threat of large and rising federal budgets. It is a threat to continued growth of our economy, and it is no less a threat merely because the budget is technically in balance.

What Should Be Done?

In attempting to hold government spending within reasonable bounds, we should *not* hold back on needed civilian programs. The heavy demands now being urged at all levels of government for roads and schools, for instance, are largely the result of failure to keep pace with the growth of the country. Furthermore, we cannot cut provisions for national security below the minimum level of safety. And unhappily, defense in the rocket and missile age is fantastically and ever increasingly expensive.

What we *can* do is enforce some financial discipline on our military leaders, and hold down our defense expenditures by making sure their demands are justified and by requiring efficiency. In the civilian programs, though some need to be increased to serve a growing economy, we can eliminate the outright waste.

A More Difficult Job

We must also do something far more difficult, and that is to reduce federal programs of aid to special groups at the expense of all the taxpayers. The new budget calls for over $5 billion for veterans, and another $5 billion for farmers. A number of industries and areas stand to receive aid in large amounts based less on necessity than on political pressure. These demands for increased aid, year after year, must be resisted if we are to have any hope of stopping a relentless rise in our budget.

Then, as our national income increases, we can look forward to reducing tax rates and providing greater incentives for the private sector of the economy. **Only in this way — by keeping government spending in line with economic growth — can we prevent our federal budget from being a crippling burden.**

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw
PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

"ROCK CUT IN CONNECTICUT"

Loading 180 Big Haulage Units All in a Day's Work for 3-yard Marion

The Killingley Thruway now under construction across Connecticut will take a lot of traffic off crowded U.S. Route 1 when construction is completed late this fall.

Hustling one section of the project toward completion is this diesel-powered Marion 101-M. The husky 3-yard shovel, working a rock cut at Norwalk, stays on the job 10 hours a day to keep a fleet of 22-ton Euclids filled and on the move. Daily output of the Marion fills 180 of the big haulage units.

Torque converter, a standard feature of the 101-M diesel, permits top-speed output in normal digging and automatically exchanges speed for increased pull in tough, heavy digging. Marionair Control also helps get big jobs like this highway excavation finished fast, keeps the operator fresh and efficient right to the end of his ten-hour shift. The oiler will tell you this is an easy machine to care for, too.

Next time you're shopping for a shovel that must do a tough job fast and well, check with your Marion distributor. He'll be glad to give you full details about these ruggedly-built machines.

Whatever your job requirement, there is a Marion machine of the right size and type for greatest efficiency.

MACHINE	SHOVEL CAP. IN CU. YDS.	HOE CAP. IN CU. YDS.	CRANE RATINGS		
			CRAWLER MOUNT		TRUCK MOUNT MAX. USABLE
			MAX.* STABILITY	MAX. USABLE	
MARION 35-M	¾	¾	18T @ 10′	18T @ 10′	25T @ 10′
MARION 43-M	1	1-1¼	27T @ 10′	27T @ 10′	35T @ 15′
MARION 362	1½	1½-2	43T @ 12′	30T @ 15′	
MARION 87-M	Special Crane		150T @ 12′	75T @ 15′	
MARION 93-M	2½	—	80T @ 12′	50T @ 15′	
MARION 101-M	3	—	84T @ 12′	57T @ 15′	
MARION 111-M	4	—	110T @ 15′	105T @ 15′	

*For Comparison Purposes Only

MARION **POWER SHOVEL COMPANY**
Marion, Ohio

SEND ME information about **MARION** ..... yard shovels, ... yard hoes and ..... ton cranes (☐ crawler mounted ☐ truck mounted). ☐ Have a salesman call.

NAME ..... TITLE .....

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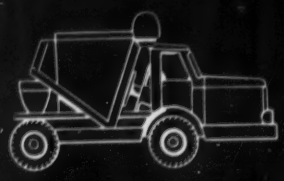
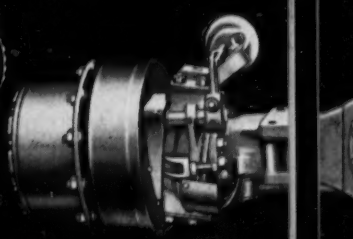
FROM TIMKEN-DETROIT®...



today's BROADEST RANGE OF PLANETARY AXLES



...both steering and rigid!

FOR HEAVY-DUTY SPECIAL EQUIPMENT AND TRUCK APPLICATION

The Timken-Detroit family of advanced design axles now includes a complete range of new planetary heavy-duty axles—with a steering axle operationally matched to each rigid axle in the line.

Versatility, ruggedness, and almost unlimited gear reductions make these new planetary axles the leaders in their line. They are going into use in practically every corner of the world on heavy-duty two- and four-wheel drive prime movers, husky off-road rock and earth wagons, big four-wheel tractors, mining equipment, heavy-duty scrapers, front-end loaders and many other units of heavy-duty equipment.

Years of TDA® research and development have brought these new and exclusive planetary outer-end features: floating ring gears—concentrically mounted ring gear hubs—full-flow lubrication of all bearings and planet gears—special forged bronze planet pinion pins—and an unusually high degree of parts interchangeability. For the newest and finest in planetary axles—depend on Timken!

Only New Timken® Full Planetary Design Brings You These Features for Extra-Long Life, and Extra Dependability:

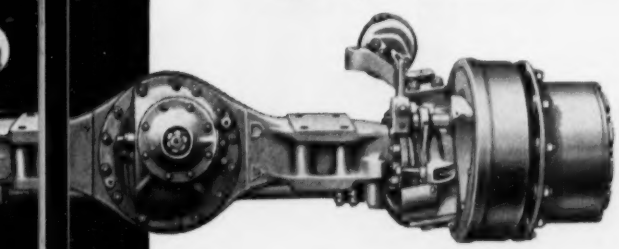
1. NEW FLOATING RING GEAR and hub are two separate pieces. Ring gear is free to float radially. This feature, combined with floating sun gear, assures equal distribution of stresses to all planetary gears, gives longer, trouble-free gear life.

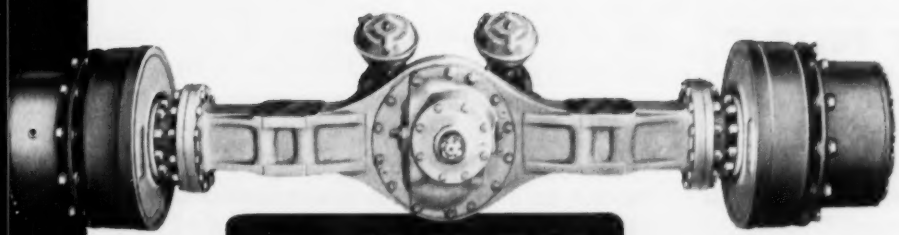
2. CONCENTRICALLY GROUND RING GEAR HUB AND SPINDLE MOUNTING SURFACES ground around a common center assures perfect alignment and fit—plus freedom from bending forces on the hub and spindle splines. Splines absorb only torsional stresses from the ring gear and transmit them to the housing.

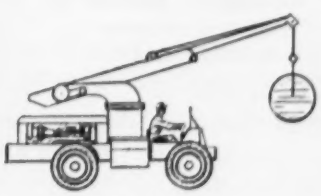
3. SPECIAL FORGED BRONZE PLANET PINION PINS of premium alloy bronze for longer, trouble-free operation. Rifle drilled lubrication channels and machined lubrication flats assure full time lubrication. When cover is assembled pin is locked in place to prevent rotation—resulting in longer pin life.

4. FULL-FLOW LUBRICATION design of Timken planetary axles assures constant flow of lubricants to wheel bearings and all planet gears while vehicle is in operation. Wheel hub and planetary spider pick up oil in the cast reservoirs as they rotate and channel it to all moving parts. When vehicle is not in motion oil is retained in these chambers providing ample initial lubrication.

5. HIGH DEGREE OF PARTS INTERCHANGEABILITY between both rigid and steering axles in the same series. This means a smaller parts inventory, low maintenance costs and more productive time with Timken planetary axle equipped vehicles.







TIMKEN Detroit AXLES

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ROCKWELL SPRING AND AXLE COMPANY
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WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSSES AND TRAILERS

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WIRE ROPE AT WORK

Now spanning the Delaware is the great Walt Whitman Bridge linking South Philadelphia with Gloucester City, N. J. The $90,000,000 structure, opening in 1957, is a project of the Delaware River Port Authority. It features a main suspension span of 2,000 ft—the eighth-longest yet built. At the midpoint of the span the roadway has a clearance of 150 ft above mean high water.

An interesting phase of the long, tough construction job was captured in the photograph above. As the picture was taken, one of the last of the truss-type floor beams was rising above the water, being lifted into position by strong, sinewy Bethlehem wire ropes. These steel cables handled the truss with ease, though it weighed in the neighborhood of twenty-two tons. The lift was a typical one for Bethlehem ropes, which can always be counted on to bring the load home.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

BETHLEHEM WIRE ROPE
BETHLEHEM STEEL

INTERMEDIATE UNIT of combination or unitized plant may be cone, rolls, or jaw crusher (shown here). Fitted with spring-mounted two-deck vibrating screen ahead of the jaws, it is also suitable as a primary in some gravel deposits. (Pioneer photo)

9. Portable Plants and Combinations

By W. A. RUNDQUIST,
Vice President
Pioneer Engineering Works

THE PORTABLE PLANT for the production of construction aggregates is here to stay . . . no doubt of that! It will remain as a tool of the contractor because it makes mobile his crushing, screening and washing operations—a factor important to him in connection with the quick hops he has to make to keep pace with his cost and progress estimates for his job.

This is not to say that the quality of material he produces will be any better than that produced by the commercial plant—nor need it be inferior. Neither is it implied that the cost per ton of producing, once the plant is in place, need differ greatly from that of producing the same material from a stationary setup.

Why then the portable plant? It is simply a matter of economics. It costs money to haul material from a stationary plant to the job where this material will be used. When haul cost becomes prohibitive it is better to move the producing equipment closer to the end-use site. And this is precisely what the portable plant does—it makes the aggregates producing machinery mobile so that the cost of moving and re-setting can be kept within limits for profitable operation.

The portable plant is nothing more nor less than an assemblage of all the component units of an aggregates processing plant on wheels. They are arranged so that they can be hauled around from job to job or from one part of a job to another part with least effort and expense.

When to "go portable" or when to use a stationary setup from the standpoint of over-all operating efficiency, can be determined only by analysis of the haul factors involved. The initial investment in a mobile plant will be higher than that for the same processing units built into a stationary plant. Chassis for the mobile units, expensive to engineer and build because

ELECTRIC PLANT NEWS

No waiting for highline power on this job!

Lightweight Onan 2,500-watt electric plant eliminates necessity of using hand tools anytime!

This project builder keeps several Onan Electric Plants on the job *from footings to finishing!* No time or money is wasted waiting for the highline to be strung. By using electric tools from the start he saves money every hour . . . pays for his electric plants fast!

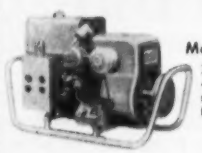
The 2,500-watt Onan plant shown above has four plug-ins . . . can operate tools and lights for a whole crew of men. Like all Onan air-cooled electric plants, it's completely Onan-built, with an Onan 4-cycle gasoline engine direct-connected to an Onan all-climate generator in a rigid, compact, long-life unit.

This contractor also uses an Onan trailer-mounted 10,000-watt plant to operate a 5 H.P. saw for gang cutting of rafters and other dimension.

You can count on Onan electric power for any construction job . . . *anywhere* . . . to save time and money.

Other A.C. models: 500 to 75,000 watts. Also D.C. and battery charging units.

Portable Power you can count on!



Model 205AJ-1P
2,500 watts A. C. 4 plug-ins. Recoil starter, carrying frame.

Series CW
7½ or 10KW. Two-cylinder air-cooled gasoline engine.

Write for folder on cost-cutting portable electric plants

D. W. ONAN & SONS INC.

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ELECTRIC PLANTS • AIR-COOLED ENGINES • GENERATORS • KAB KOOLER

PRODUCING AGGREGATES . . . continued

of their complexity and compactness, often run higher in over-all maintenance costs. Yet, in spite of these extra costs, the portable plant's mobility will become more and more the influencing factor in the production of aggregates for the roadbuilding program ahead. Commercial producers of highway aggregates also will find it good business to augment their operations with portable plants to process material closer to the job site.

Portable aggregates plants vary from the wheel-mounted simple, single crusher to the complex multi-unit plant capable of producing crushed, sized, and washed aggregates from any suitable material found anywhere in the world. As new needs have arisen, because of different source materials or specifications covering finished product, portable equipment has kept pace.

Ready Assembly

The biggest problem—and one of growing importance—is the necessity for meeting load and axle weight limits for highway transport. This leads to increasingly ingenious ways of combining conveyors for quick detachment and hauling on their own individual trucks. It has also led to easier dismantling of feeders, screens and crushers for separate transport where necessary. The Fruehauf hitch, or the fifth wheel, for towing by tandem-axle truck-tractors has added to the mobility and maneuverability of the larger units.

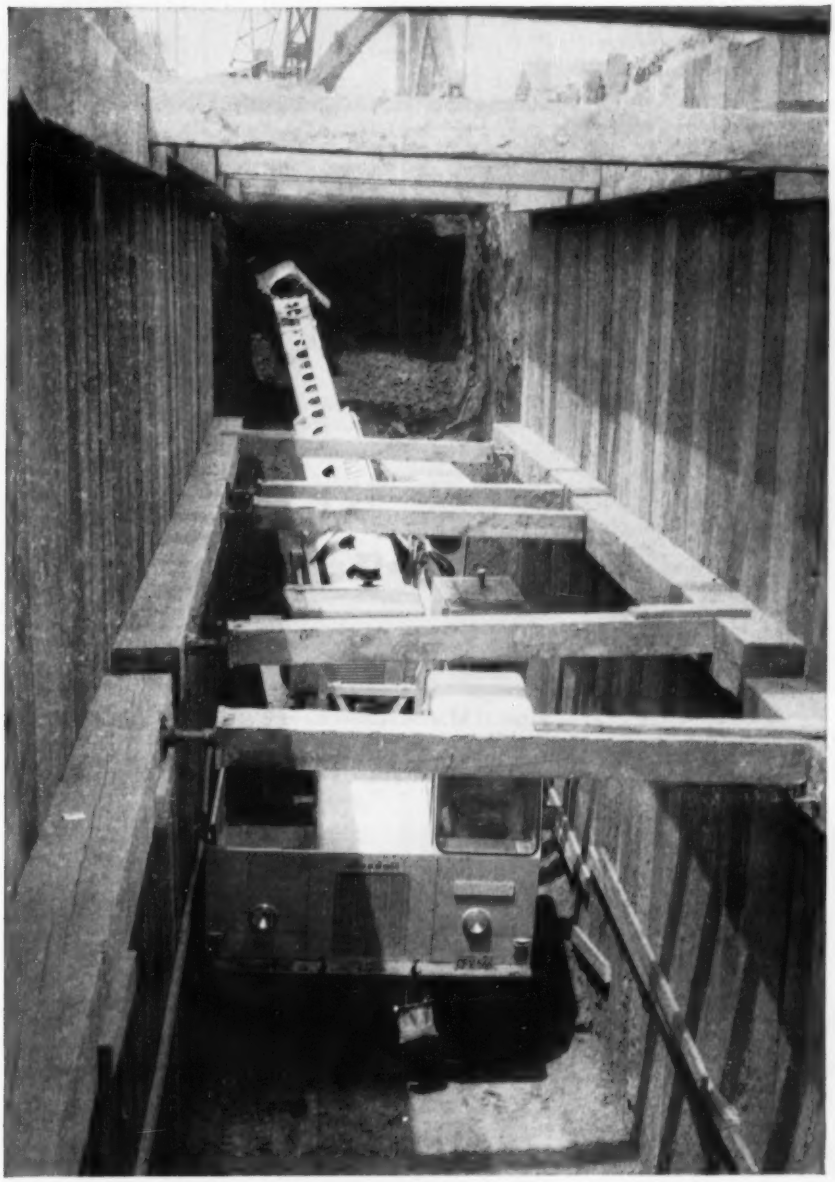
Refinement in portable-plant chassis, through broader application of the scientfic design of frame and truss members, has helped reduce plant weights. Further, standardization of chassis wherever applicable has helped the buyer get the most in plant function for the money invested.

Through continuous research and development by manufacturers of tires, wheels, and brakes, the portable plant user gets the best available in rolling stock. Engine builders have made special efforts to develop high-powered units of proper speeds combined with less weight and smaller space.

The modern portable aggregates plant has simplified drives. These result from better component arrangement and from new developments in power transmission. V-

"IMPOSSIBLE JOB? NOT FOR OUR GRADALL!"

says A. Teichert & Son, Inc., Sacramento, Calif.



A. Teichert & Son, Inc., Sacramento, uses Gradall to speed work on the building of a reinforced concrete box storm drain for the Los Angeles Flood Control District.

Working on the bottom of this narrow 26-foot deep trench, a single Gradall speedily, safely and economically loosens muck from around existing utility lines—without any damage to these vital pathways.

Less than one-foot clearance on either side of the cut limited the Gradall's swing, but by adding wings to its 3-foot excavating bucket and using 4-foot boom extension, Gradall easily cut the full 12-foot width.

As for savings: Air-powered hand spades previously took 7 days to clean out 560 yards from around *three* utility lines —with their Gradall, 740 yards of muck were removed from around 5 utility lines in less than 4 days, cutting costs and permitting following work to keep on schedule.

Gradall's fast attachment changes, mobility and extreme working accuracy add up to greater contractor profit on every job. For convincing proof, contact the Gradall Distributor in your area and arrange for a demonstration on your own jobs.

Gradall cuts costs on all these jobs... and more!

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- Excavating and loading
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(Advertisement)

Short-Cuts in Paving Bridges, Approaches and Secondary Roads

The slow, tedious, costly job of paving bridges, approaches and other sections of highways and turnpikes where heavy equipment cannot successfully operate has been simplified and speeded-up by many contractors through the use of Whiteman concrete Power Buggies,* Vibrators and portable Screeding Machines.

Loading at the batching plant, hopper or truck mixer, the Whiteman Power Buggies carry their full 13 cu. ft. of concrete at a fast clip along narrow runways, over light falsework, under low overheads, up steep grades. Dumping is fast and accurate. Unlike hand buggies, they never tire or slow down. One man with a Power Buggy can pour as much concrete in a day as five men with hand equipment.

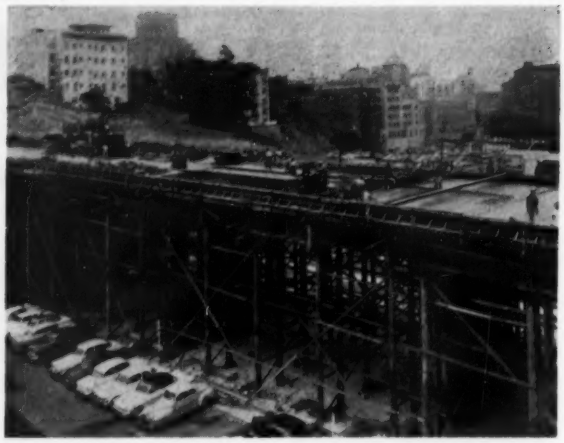
Vibrating is accomplished quickly, thoroughly with heavy duty, rugged Whiteman vibrators on wheelbarrow bases.

Smooth, level screeding is done in record time with the portable Whiteman Screeding Machine. Quickly adjustable for slabs from 3′ to 24′ wide. Puddles and vibrates the concrete throughout the entire depth and area, thoroughly compacts the slab. Heavier aggregates remain in suspension, resulting in a superior, far more durable slab.

For complete information on Whiteman concrete equipment, call your Whiteman Distributor or write: Whiteman Manufacturing Company, 13020 Pierce St., Pacoima, California.

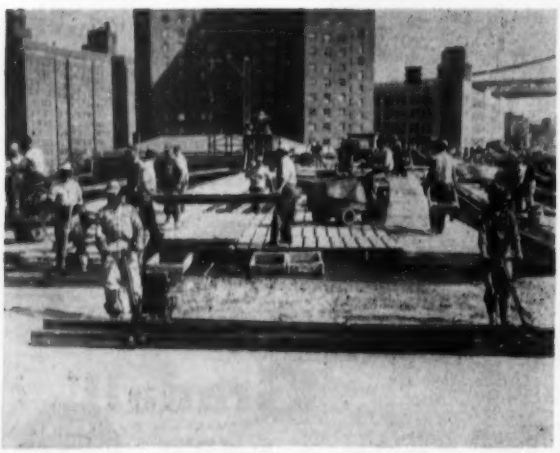
*Trademark

Whiteman



Light falsework on freeway overpass in Los Angeles precluded use of heavy equipment. Whiteman Power Buggies carried concrete from mixer-fed hoppers over portable runways, completed pour in record time.

A full 23 ft. width is screeded to a perfect level on approach pavement to Mackinac Straits Bridge by Whiteman Screeding Machine. Telescopic frame adjusts for widths from 3 ft. to 24 ft. Results are equal to larger equipment.



215 yards of concrete per day were poured high above heavy traffic on New York Elevated Highway job. 4 Whiteman Power Buggies operated on portable runways. 2 Whiteman Screeding Machines covered 37½ ft. width.

On bridge section of new U. S. Highway 79 in Arkansas, Whiteman Power Buggy delivers a load of concrete. Contractors have found these tireless workers really speed up the job, save valuable time and cut costs.

FIGURE 1. IOWA PHOTO

all cases identical with those built for commercial plant operation. In most instances they are interchangeable between the portable plant and the stationary plant. Deviations sometimes occur in the screens, however, due to restricted headroom and space limitations.

The Simple Plant

Disregarding the one-unit wheel-mounted small crushers, the simplest of the portable crushing plants are those of the single-pass

PRODUCING AGGREGATES . . . continued

belts and sheaves have replaced most of the chains and sprockets formerly used; shafts generally turn in anti-friction bearings. There is a greater trend toward off-plant mounting of power units. Here again, long belts have been eliminated by end-coupled jackshaft drives from separately mounted portable power units.

Most portable plants are either mechanically driven or "electrified." With the former, a diesel unit drives all the components on a single chassis through V-belts and sheaves, shafts and gears, with possibly a chain drive here or there. The electrified crushing and screening plant generally is mechanically driven from diesel engine to the crushers, with screens and conveyors driven by individual electric motors. Its electric power is most often developed by a diesel-generator set.

All-Electric Plants

An "all-electric" plant is equipped with electric motors to operate all the components, including crushers. Usually such plants are set up where "high-line" electric power is available. The all-electric plant is not too practical where power must be generated on the job because of the loss in efficiency in converting from mechanical to electrical power in the higher horsepowers. Electrical operations of screens and conveyors, however, simplifies the drives to these units and permits greater plant flexibility while cutting overall maintenance.

The portable plant is a compact machine but it is in no wise a light-duty one. The units that comprise it—crushers, screens, feeders and conveyors—are in practically

DON'T SEARCH FOR POWER OUTLETS

for tools and lights to perform maintenance work.

DON'T SEND FOR AN ELECTRICIAN

to hook up your welder for repair jobs.

USE A WELDANPOWER!

Weldanpower is a light, but powerful gasoline engine driven combination welder and power plant.

As a power source, Weldanpower furnishes 4 KVA of 115 or 230 volt power for continuous duty.

Welds and furnishes power at the same time.

As a welder, Weldanpower supplies 200 amps. of welding current for all maintenance work.

Weldanpower is the heart of a maintenance man's portable repair truck.

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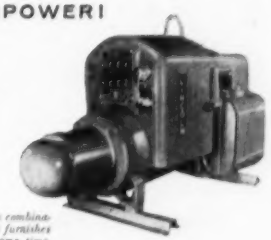

Weldanpower, Lincoln's combination welder-power unit furnishes both currents at the same time.

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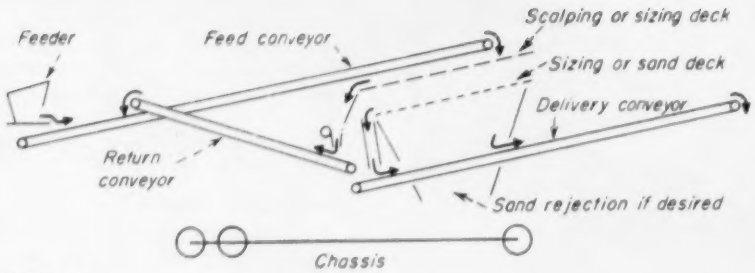

FIGURE 2.

type (**Fig. 1**). It consists essentially of a small jaw crusher, a reciprocating plate feeder ahead of a small scalping screen, and a collecting conveyor that discharges to truck or bin. The screen scalps off material requiring crushing, and bypasses the jaw crusher with material not requiring crushing.

In a gravel plant of this type, gradation of the material processed will depend on proportionate sizes of material in the pit, size of screen openings, and setting of the jaw crusher (which probably can be set down to ¾ in.). Production will not be high because of the small size of units involved. However, it is a handy plant for small construction jobs, county and municipal roadbuilding and repair work, and for out-of-the-way projects. Many contractors have gotten their start with this type plant.

Next in line among the simpler plants is one that offers more screening capacity and the possibility of some sand removal. This plant has somewhat larger jaw crusher and a larger screen.

The screen's top deck scalps off material to be crushed. Material already to size is removed by the second deck and bypassed around the crusher to the delivery conveyor. Sand, passing the second deck, can be rejected. Or any portion of it can be blended with the sized material.

This scalping-screening arrangement lends itself to a further modification (**Fig. 2**). Here the crusher can be operated in a closed circuit with the screen to give further gradation of output. Even with this modification, however, crushing capacity when producing the smaller sizes of product will be comparatively low.

In-Line Duplex Plants

The conventional duplex-type plant (**Fig. 3**) is developed from the plant in Fig. 2 by adding a secondary crusher and rearranging the screen. Because pit material is fed in at one end and processed material is drawn off at the other as a single product, this type plant is often referred to as an in-line plant to distinguish it from other types of duplexes.

In the in-line duplex plant, pit material is fed onto a belt conveyor that discharges to the top deck of the screen. This deck's screen openings hold the passed material to a size that can be fed

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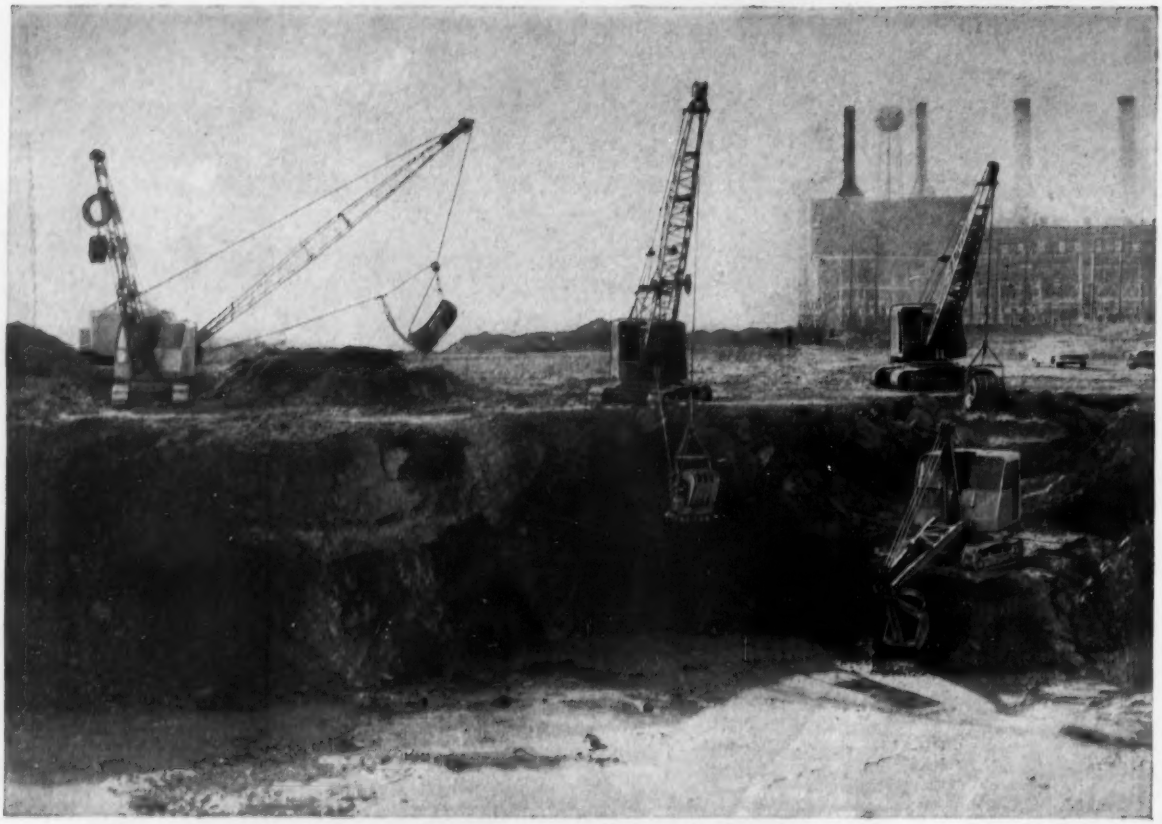

HOW FIVE BAY CITY EXCAVATORS DIG OVER 400,000 YARDS OF CLAY FOR ¾ MILE CANAL

An excavation of more than 400,000 yards is a mighty big project . . . even to an oldtimer in the field, like Walraven Bros. & Sons whose BAY CITY excavators are here shown at work on an impressive and important industrial drainage canal.

In this striking action photo, one ½ yard crawler is working as a frostbreaker on frozen surface-soil; a second as a back hoe—while 3 draglines (1½ yd., 1 yd., and ¾ yd. sizes) take big-capacity scoops of soil at every bite! Notice that the back hoe (lower right) is performing the tough job of breaking and moving heavy blue clay.

This big ditch ranges from 17 to 26 feet deep; has 100 foot bottom, and 150 foot top. The completed canal will be used to drain hot water from a gigantic utility plant to a lake three-quarters of a mile distant.

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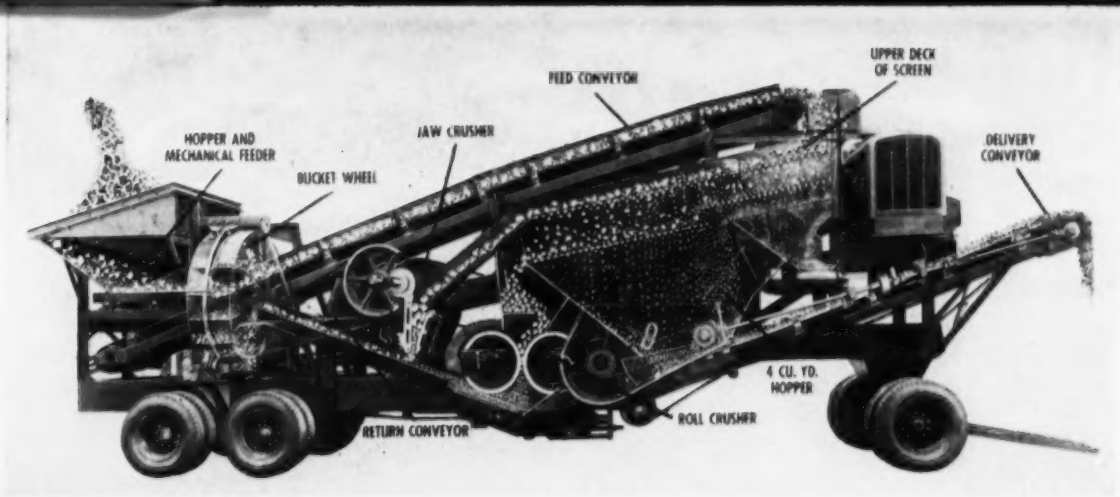

FIGURE 3.

PRODUCING AGGREGATES . . . continued

to the secondary crusher, usually a roll. Material retained on the top deck is routed to the primary crusher, which usually is a jaw. The products from both crushers are picked up on a belt conveyor for delivery back to the top deck of the screen.

Sizing of product is done on the second deck, with provision for some sand removal on a shortened screen below the second deck. Hence the in-line type of duplex is a one-product machine, or a single-aggregate plant. As such it is a good plant for high-capacity production of road gravel or for the aggregate used in some types of bituminous mixes.

All manufacturers of portable plants build the in-line duplex. In their most popular size, all use units of about the same characteristics or equivalent capacities. Typical specifications call for a 1036 jaw crusher, a 3024 roll crusher, and a 4x12-ft 2½-deck inclined or horizontal screen. Plants varying from this, particularly with respect to the size and arrangement of the secondary crusher, are available from some manufacturers.

Bottom-Deck-Feed Duplex Plants

A variation from the in-line top-deck-feed duplex, described above, is the bottom-deck feed.

In the in-line duplex plant, the top full deck is used for scalping to the jaw crusher, while the second deck is used for scalping to the roll crusher and for sizing. In the bottom-deck-feed plant, 3½ decks are used instead of 2½. Feed from the pit is to the third deck from the top, usually referred to as the bottom deck. Both the bottom deck and the top deck are equipped with specification size openings in the screen. Hence there are two

JUST ONE MAN LOADS 13 TONS IN TWO MINUTES!

Model "OT"-13
tandem $2,295.00*

on a MILLER tandem *Tilt-Top!*

You can put wheels under BIG equipment FAST, with a MILLER Tilt-Top. There's no need to bother with the extra loading time . . . extra cost of larger, more cumbersome trailers. With a MILLER OT-13 it takes ONE man less than TWO minutes to load this big Barber-Greene paver . . . and be off to the next job with no lost motion. This faster loading, precise easy backing, on-a-dime maneuverability, cuts time between jobs . . . ups *profit*—production time for men and equipment every day! Tilt-Tops from 3 to 15 tons capacity—equipped with single or tandem axles . . . over, or between-the-wheels platforms . . . puts mobility, under dozers, pavers, rollers and trenchers of almost any size or shape.

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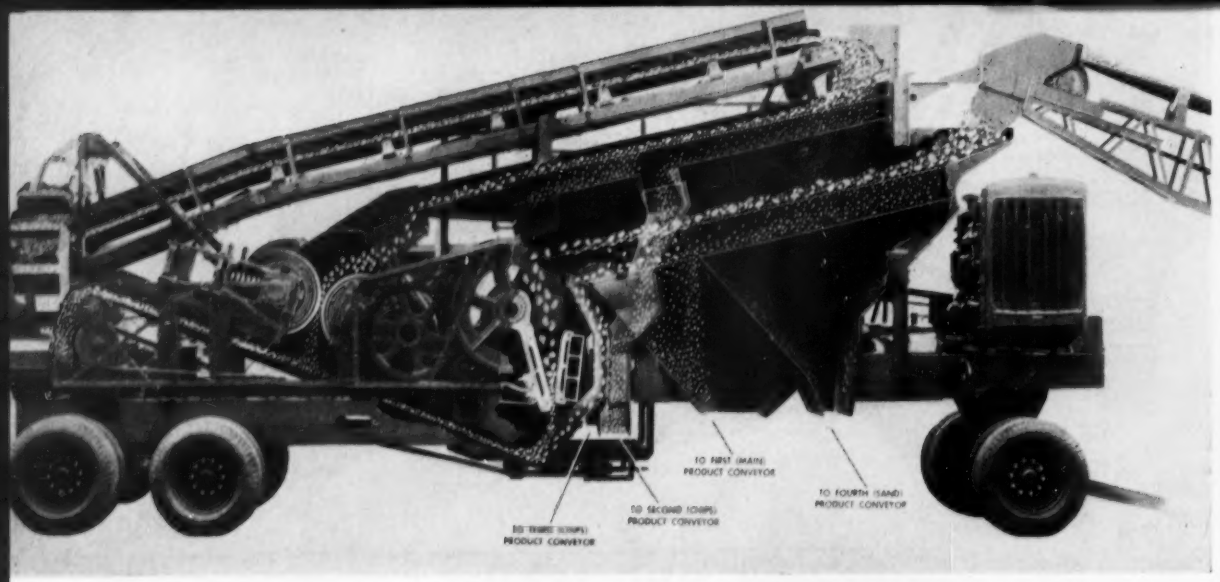

TO FIRST (MAIN) PRODUCT CONVEYOR
TO SECOND (CHIPS) PRODUCT CONVEYOR
TO THIRD (CHIPS) PRODUCT CONVEYOR
TO FOURTH (SAND) PRODUCT CONVEYOR

FIGURE 4.

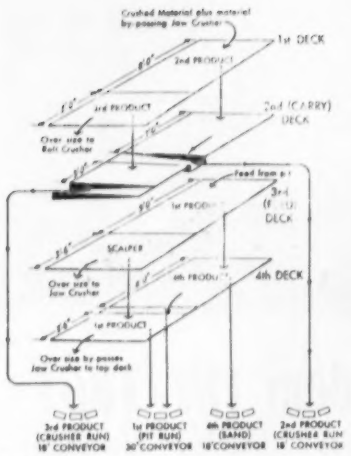

Crushed Material plus material by-passing Jaw Crusher
1st DECK
2nd PRODUCT
2nd (CARRY) DECK
Over size to Roll Crusher
Feed from pit
3rd (FEED) DECK
SCALPER
4th DECK
Over size to Jaw Crusher
1st PRODUCT
Over size by-passes Jaw Crusher to top deck
3rd PRODUCT (CRUSHER RUN) 18' CONVEYOR
1st PRODUCT (PIT RUN) 30' CONVEYOR
4th PRODUCT (SAND) 18' CONVEYOR
2nd PRODUCT (CRUSHER RUN 18' CONVEYOR

FIGURE 5.

PRODUCING AGGREGATES . . . continued

full decks for sizing the material. In addition, the bottom deck serves also as a scalping screen ahead of the jaw, and the top deck serves also as a scalper ahead of the roll.

Each type of plant has its advantages and disadvantages. The top-deck feed has better scalping action, but lack of gradation control. The bottom-deck feed lacks the scalping action ahead of the jaw, but has more sizing capacity and better gradation control.

Recently there has been developed a duplex plant combining the good features of the top-deck feed and the bottom-deck feed. It has still more flexibility so that, by screen changes and crusher adjustments, multiple sizes of well graded aggregates can be produced simultaneously. **Fig. 4** shows a cutaway of this plant as it would be used for the production of four sizes of material, including sand. **Fig. 5** shows the screen arrangement to correspond, while **Fig. 6** and **7** give screening arrangements for (a) full deck scalping ahead of the jaw crusher and (b) full deck sand removal.

It is difficult to state how many tons or yards an hour can be produced by any given duplex plant. There are usually too many if, ands, and buts to make valid any claims. Pit conditions are the big governing factor. For any given pit analysis, theoretical calculations on output can be made. Actually, however, such figures mean little. That's because once having selected a plant with certain size units for crushing and screening, nothing much can be done except to take the most one can get from the plant under the conditions governing. A plant may produce 300 tons an hour from one pit but only 150 tons from another, with the same crew on the job. An operator's experience in an area is the best guide to anticipated production.

Unitized, or Combination Plants

Duplex plants are of necessity compact, package-type machines with limitations on the size of feed they can handle and the kind, or kinds, of product they can deliver. But there are many jobs on which the production of aggregates requires more and larger pieces of portable equipment. Here the field is wide open and the alert con-

continued on page 201

FIGURE 6.

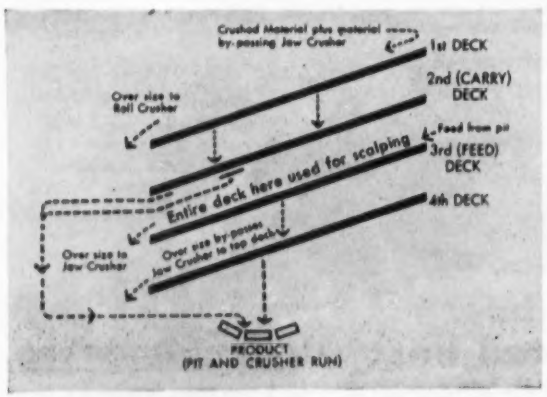
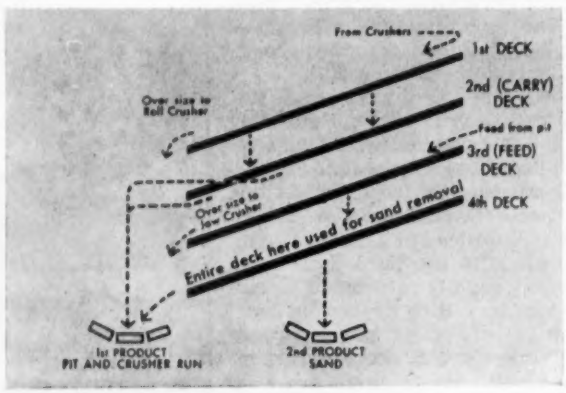

Crushed Material plus material by-passing Jaw Crusher
1st DECK
2nd (CARRY) DECK
Over size to Roll Crusher
Feed from pit
3rd (FEED) DECK
Entire deck here used for scalping
4th DECK
Over size to Jaw Crusher
Over size by-passes Jaw Crusher to top deck
PRODUCT (PIT AND CRUSHER RUN)

FIGURE 7.



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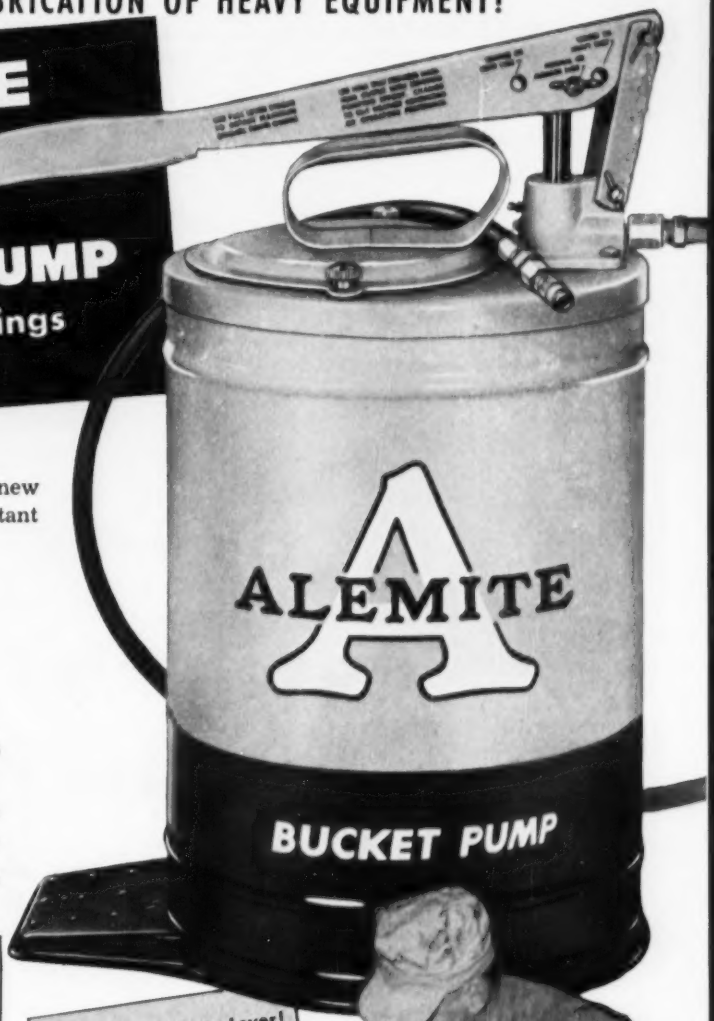

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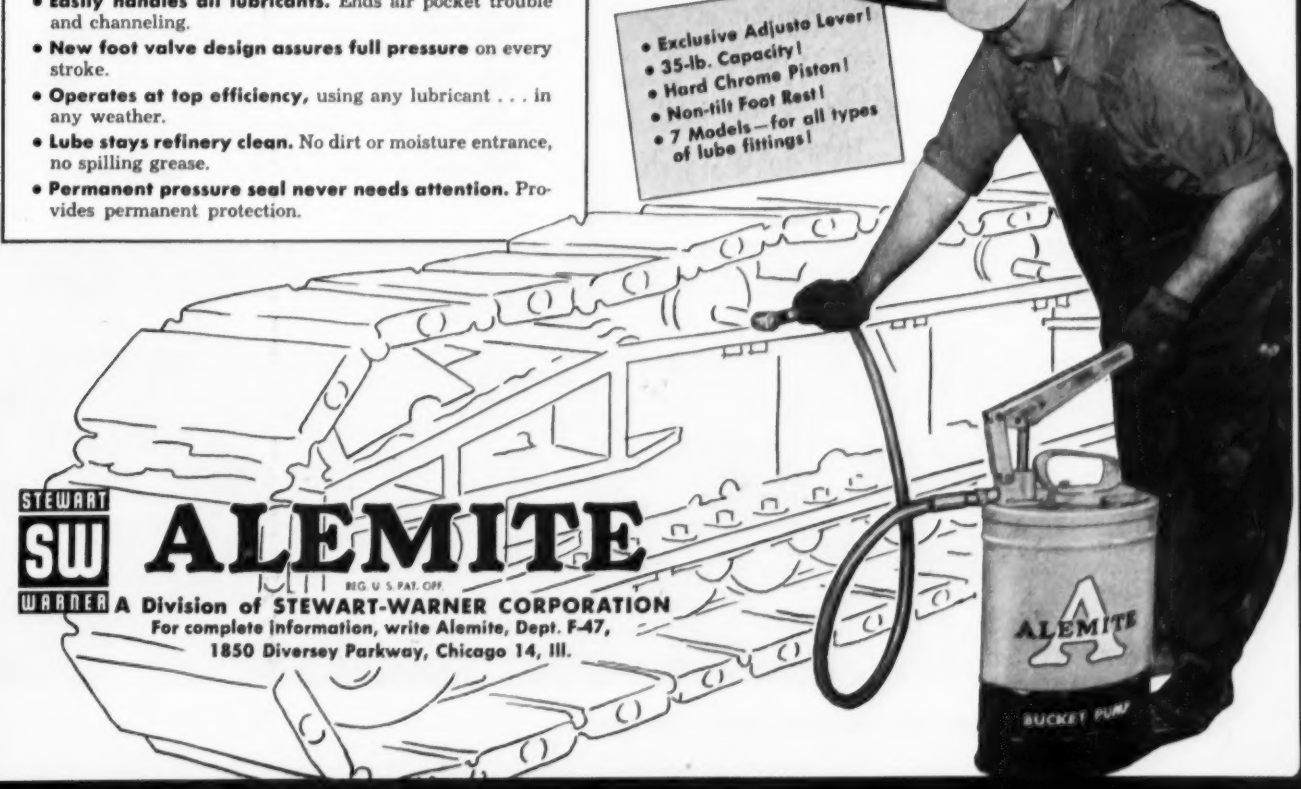

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INDIANA TURNPIKE More miles of Indiana Turnpike were finished with Flex-Plane machines than any other.

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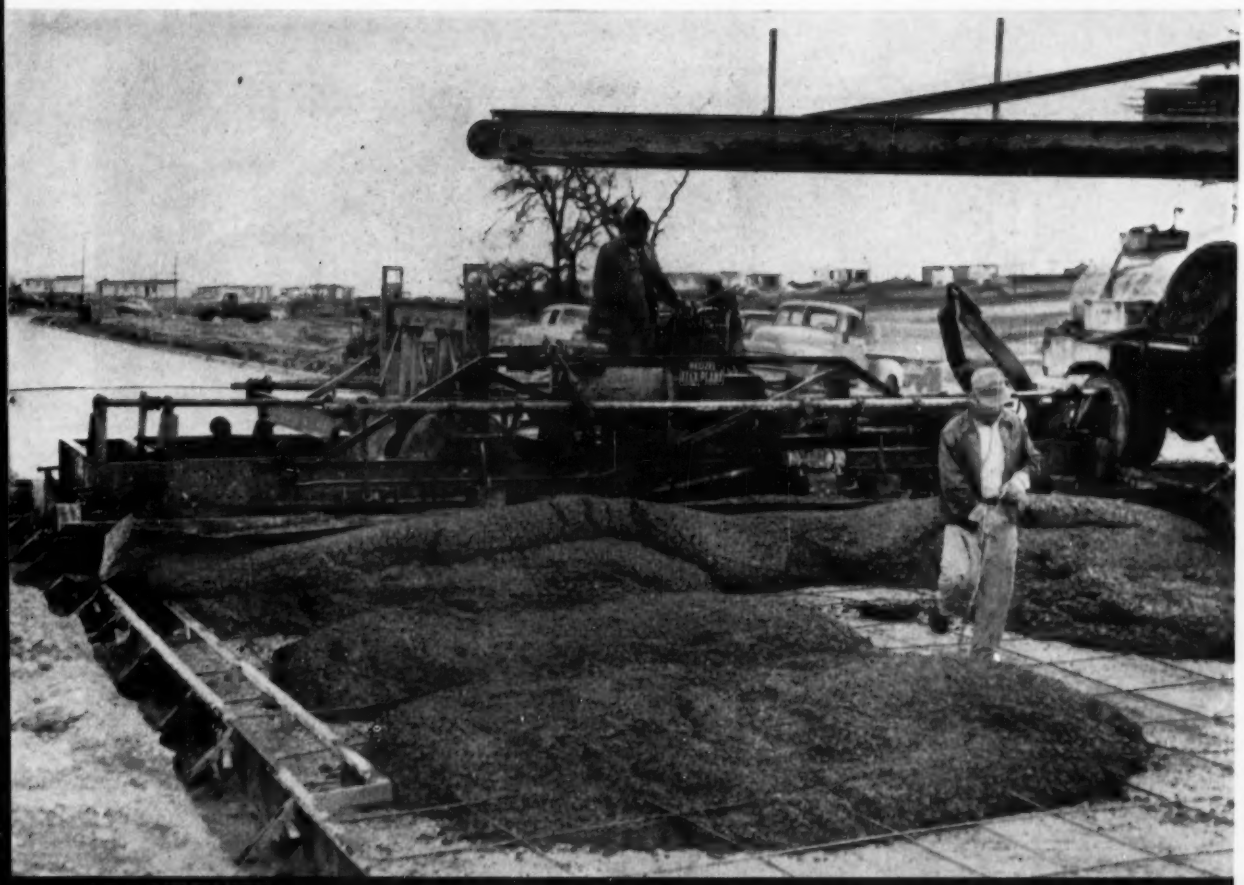

TEXAS CITY STREETS Contractor reported highest pouring ever. Credits Flex-Plane. Note amount of concrete in front of screed here.

better! It is more flexible, stronger and faster than ever! Inherent frame design features allow the greatest amount of flexibility—*even as much as 12 to 25 feet in one machine!* And, there is a complete line of FLEX-PLANES to cover any width range desired. Only FLEX-PLANE self-widening offers independent control of extension frames, which means both sides of the machine can be extended or retracted together—*or individually*, for the negotiation of complicated interchange patterns involving variable width and short radius super elevated curves. But, more important, it is the only really proved self-widening machine available today. More than 60 units operating throughout the nation attest to this.

The FLEX-PLANE carries the largest screeds in the industry-delivering the most satisfactory finish possible. Exclusive butt joint screed design enables screed lengths to be changed faster, easier than ever before. It is completely portable—a flick of the finger and it, instantaneously, becomes its own trailer.

Why not let FLEX-PLANE put you in contact with a FLEX-PLANE user? Talk to him and we are sure you, too, will GO FLEX-PLANE IN 1957!

GARDEN STATE PARKWAY Contractor watched machine operate on nearby Route 1 project. Bought immediately.

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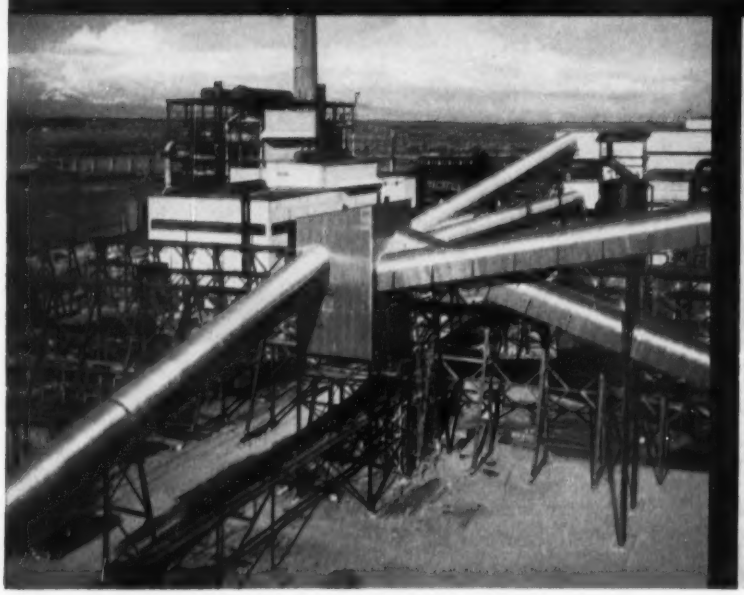
503 THOMAS ROAD · WARREN, OHIO

261

Conveyor Belts...



By the foot...

just 60 feet of new U. S. SteepGrade belting (on this Travelift, Phelps Manufacturing Co., Van Nuys, Calif.) helped *triple* the daily hauling capacity of this California roofing company.

By the mile...

world's longest wood pulp conveyor system (Weyerhaeuser Timber Company, Everett, Washington) utilizes two-and-a-half miles of U. S. Giant® conveyor belting.

Regardless of the size of belt—regardless of the job—regardless of the location—your reliable supply point is the nearest U. S. Rubber District Sales Office.

Complete belting service, expert splicing, belt engineering and conveyor design help, and the most complete line of materials handling belts—all are yours without delay.

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Mechanical Goods Division

United States Rubber

DUPLEX PLANTS carry jaw-crusher primary and roll-crusher secondary, with the screen either horizontal (above) or inclined (below). (Iowa Mfg. and Diamond Iron photos)

PRODUCING AGGREGATES . . .

continued from page 196

tractor or producer can today assemble mobile units to give him performance and operation equal to that of the most deluxe stationary plant.

Perhaps the most striking example of this is the large portable plant (**Fig. 8**) developed for the Armed Services. It can produce in excess of 200 tons an hour of crushed screened and washed 1¼-in.-minus aggregate. And it includes separate manufacture of sand (¼-in. minus) to the extent of 40% plus or minus 1%. This electrified plant comprises 14 mobile units, has its own diesel-generator set, mechanical power to all crushers, and is fully push-button controlled. It stretches out to over 250 ft in length, with several units placed side-by-side.

Just as duplex plants have gone through a transition of development for greater efficiency, more versatility, and broader adaptability, so has the combination plant. Only a few years back contractors' combination plants consisted mainly of two units; a primary and sec-

PORTABLE SETUP includes separate jaw crusher, cone crusher, and screening unit, all easily moved. (Nordberg Mfg. photo).

Big rock cut near Little Alum Pond on Massachusetts Turnpike. Insurance costs can spell profit or loss on jobs like this.

PUT AJAX TO WORK FOR YOU

High insurance costs can endanger your profits. That makes it imperative to do everything possible to reduce accidents. And the National Safety Council confirms that safety messages which get read offer effective help in accident-prevention programs.

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United States Envelope Company

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ondary. The primary and the secondary still exist, but they have been augmented by various intermediate units to step up total production, to provide for production of more sizes, or to improve gradation characteristics. Also, primaries and secondaries have been changed in function and design so that much more can be done with these units now. Primary plants of today can be equipped with crushers all the way up to the 3042 size jaw.

Fig. 9 shows the typical two-unit combination plant of a few years ago. There are many such plants in operation today, so it is far from obsolete. In some areas, improved primary production is achieved by having a scalping screen ahead of the jaw crusher (**Fig. 10**). Other types of primaries are shown in the illustrations. These primaries are being used for both quarry and gravel applications, with short or long feeders as desired (**Fig. 11**). Since the long feeder is on wheels and readily detachable from the main plant, it is a complete mobile unit by itself to be towed behind a truck. It reduces the bulkhead required for truck or dozer feeding.

Note in Fig. 9 the double screening arrangement of the secondary plant. This is accomplished by a splitter at the discharge end of the top conveyor, which splits the feed to two decks of the sizing screen. This type plant, while taking a coarse feed at the primary, will produce only one size of product while rejecting a certain amount of sand, both natural and crushed.

Other Secondaries

While this secondary shows rolls for final reduction, there are other combinations available. For fine reduction in non-abrasive material, or for the preparation of agricultural limestone, a hammermill might be used. In other cases the cone crusher may be the answer. For greater reduction while producing, let us say, 1-in. or ¾-in.-minus material, a triple roll may be substituted for the twin roll.

As to intermediate plants, they vary from jaw crushers to cone crushers to rolls, with or without scalping and sizing screens. Each has its merits, and much depends on what the end product, or products, must be. In addition, consideration should be given to possible

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—A MIDWEST CONTRACTOR

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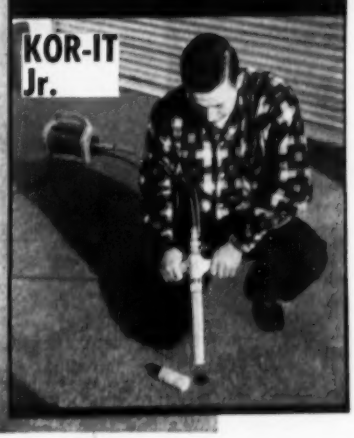
KOR-IT cuts round holes 1" to 8" dia. and 10" deep, plus 9" extensions as required. Two horsepower G.E. motor 110-220 volts; or 3½ h.p. gasoline engine. Machine counterbalanced to exert correct pressure. Operates any position, vertical to horizontal. Compact, portable. Total weight 165 lbs.



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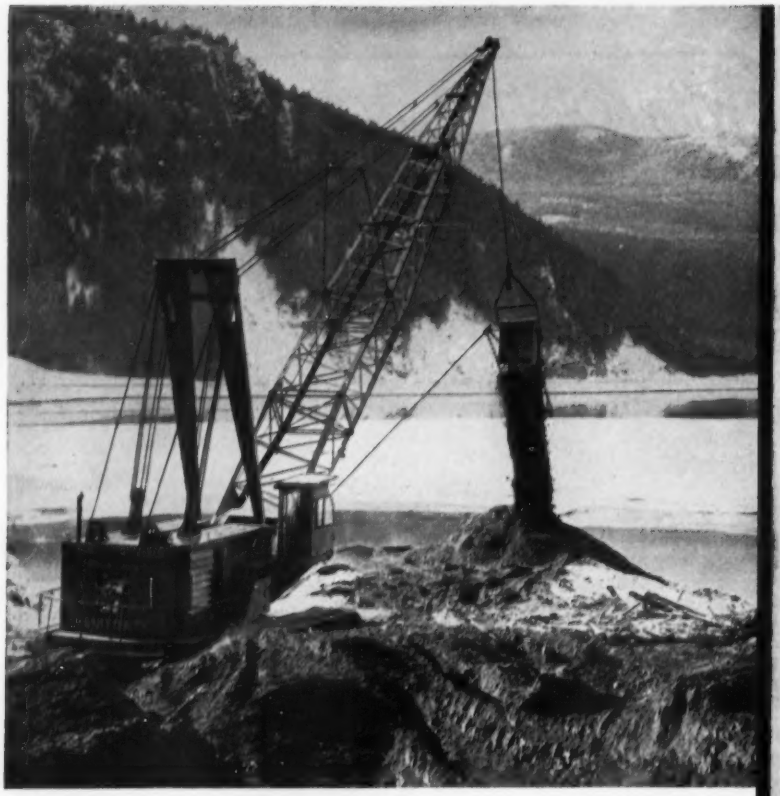

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PRODUCING AGGREGATES . . .
continued

other uses of the intermediate plants. There are many areas of the country where an intermediate plant can be used as a primary, for example, particularly where the feed consists of gravel of a top size not requiring the feed opening provided by a large primary. In such areas, a jaw-type intermediate plant with a scalping and sizing screen ahead of it may be found quite advantageous. Or it may be, for reasons of closer control or gradation, that a cone crusher or large-size roll crusher plant could be used without the primary. The point is that the experienced producer, from his knowledge of the performance characteristics of various types of crushers, can now select for his use in a portable plant almost any combination of units he feels will best serve his requirements. A jaw crusher intermediate plant, suitable also as a primary in some gravel deposits, is shown in **Fig. 12.** It may be equipped with a 1536, 2036, or 2436 jaw crusher and 4x8-ft two-deck screen. Another intermediate plant, equipped with a 4-ft standard cone and a

FIGURE 8.

FIGURE 9.

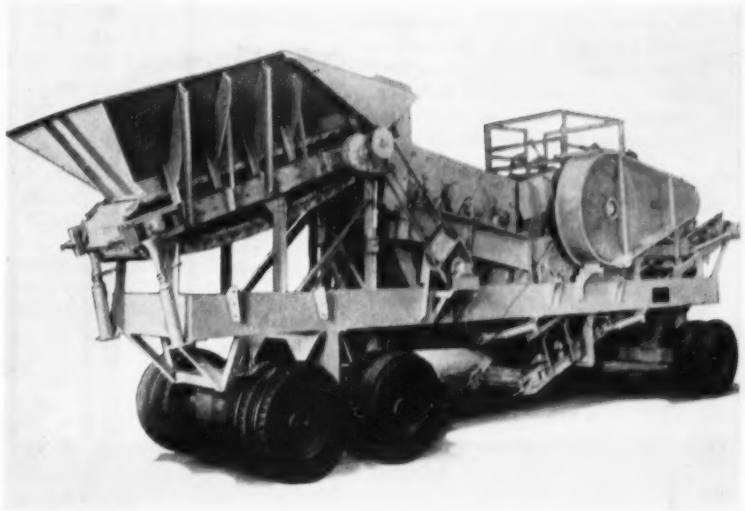
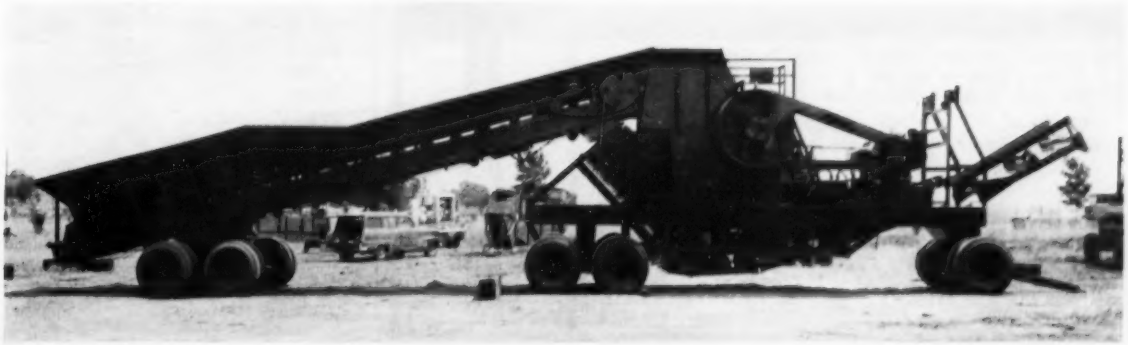


FIGURE 10.

FIGURE 11.



flat-type screen is shown in **Fig. 13.** This type crusher will take about a 5-in. feed and reduce the material to about ¾ in.

In the selection of intermediate plants, one important factor should always be considered: Is the crushing unit large enough to relieve the reduction load on the secondary (final reduction unit) with the primary opened wide enough to insure a satisfactory rate of production? It is of utmost importance, when combining multi-stage crushing plants, that the maximum stage of reduction for any of the units following the primary be not exceeded. If it is, the unit so affected will be overworked, even though it may be handling only its share of the load so far as tonnage is concerned. Any unit overworked is apt to break down. And when this happens, the whole plant will have to be shut down for repairs. In a stationary plant, this contingency can be guarded against, to some extent at least, by the use of surge piles. With the portable plant, however, the idea is quick mobility and the ability to move with the job. Hence surge piles may not work out too well—in fact, they can be a hindrance. This, of course, does not refer to stockpiles which may be produced in advance of use so that the plant can move on.

FIGURE 12.

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How to Choose

Fig. 14 shows a three-stage gravel plant schematically laid out to show the interrelations and functions of the units. The chassis have been omitted for the sake of simplicity.

The primary unit includes a scalping screen and a jaw crusher. The intermediate plant has a scalping and sizing screen, and a crusher that might be either a cone or rolls. The third plant has a sizing screen and a final reduction crusher which, experience tells us, should be a roll crusher.

Now, as to the reasons for these units:

1. We use the jaw crusher as the primary because it has a large stage of reduction to take boulders, breaking them down to a size that can be handled by the intermediate crusher. It also has maximum strength coupled with comparatively light weight—ideal for the portable plant.

continued on page 209

JOHN DEERE *Mobile Work Units*

DO SO MANY JOBS SO WELL

John Deere 4-roller crawler tractor (30 engine horsepower) leveling ground new housing development. Owner: F. D. Sperry Co., Burlingame, California.

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With a modern, work-eating John Deere Tractor (crawler or wheel-type) you have a highly mobile unit that will do a man's work at boy's wages. For nearly 40 years John Deere-built tractors have earned a world-wide reputation for this big daily work capacity at low costs for fuel, oil, and maintenance.

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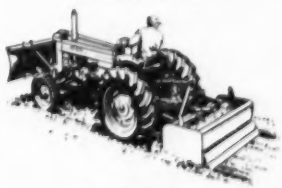

No. 61 Dozer and Scari-Scraper

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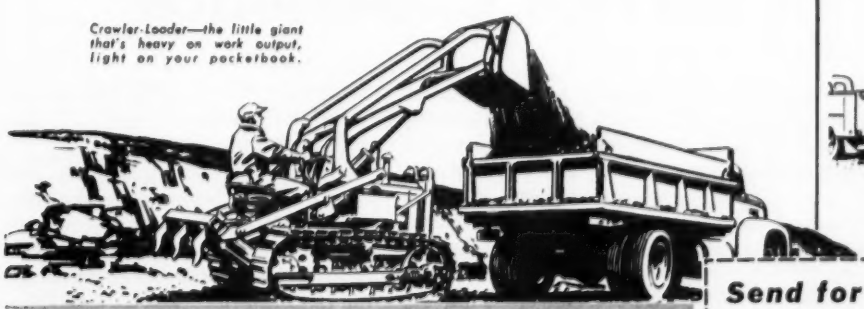

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NORDBERG PHOTO

FIGURE 13.

between the two decks. This half deck, plus the lower half of the bottom deck, will be used for our smaller size product. The upper half of the bottom deck will be equipped with sand mesh. The sand mesh and the sizing mesh on the bottom deck will be separated by a transverse gap to allow the smaller product to pass over the sand screen into the collecting hopper.

continued on next page

PRODUCING AGGREGATES . . .
continued

2. The scalping screen ahead of the jaw will pass stone and gravel that can be handled by the intermediate crusher, thus saving jaw-crusher capacity for the larger stone. If desired, a second deck can be added to the scalping screen to remove dirt and other deleterious fines.

3. Either a roll or a cone crusher will be selected for the intermediate crusher. If the cone crusher is used, we may be able to feed it larger stone than we can feed the rolls. However, the rolls will be easier to maintain, especially the welding-up of worn manganese if the gravel is hard and abrasive. Further, if we need to produce several sizes of closely graded material, the rolls will likely have a wider range of adjustment; and less load will be imposed on the sizing screen (on third unit).

4. A scalping screen is used ahead of the intermediate crusher to by-pass material readily handled by the final reduction crusher. A second deck on this screen will enable us to remove a size of material at this point. This material can be used separately, or blended with the material produced in the third unit, as desired.

5. Rolls are selected as the final reduction crusher because they will give us closer gradation control and because they will be the easiest to maintain.

6. The sizing screen will be a split-feed type if we are producing only one size product at this point. This will give us extra screening capacity. If we want to take off two products at this point, we will use a two-deck screen with openings to size. If it is necessary or desirable to take out sand, we can do so by adding a half deck

ROCKFORD

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- With Less Size

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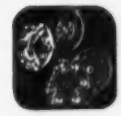
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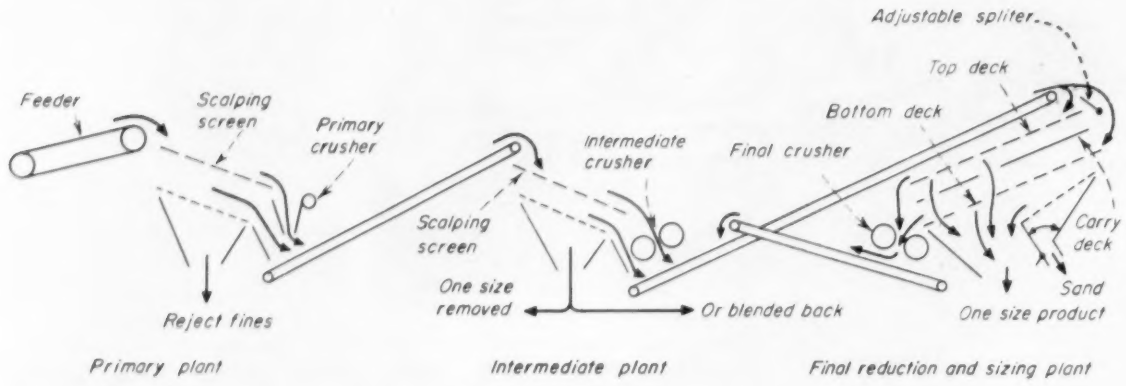


FIGURE 14.

Now, let's see how a plant of this kind could be set up to produce ½-in.-minus product from a pit requiring 30% crushing. Since this is all we know about the pit, we'll have to make some assumptions. Assume that the pit analysis will break down something like this:

Plus 2 in.	10%
2 in. to 1 in.	10%
1 in. to ½ in.	10%
Minus ½ in.	70%
	100%

Let's make the following settings of the crushers:

Primary	2 in.
Intermediate	1 in.
Final Reduction	½ in.

The screen openings will be:

Primary	
Scalping	2 in.
Intermediate	
Scalping	1 in.
Sizing	⅜ in.
Final Reduction	
Both Decks	½ in.
Sand Screen	No. 4 mesh

CALCULATIONS:

Primary: Pit conditions and screen setting show 10% of the pit material will go through the jaw crusher.

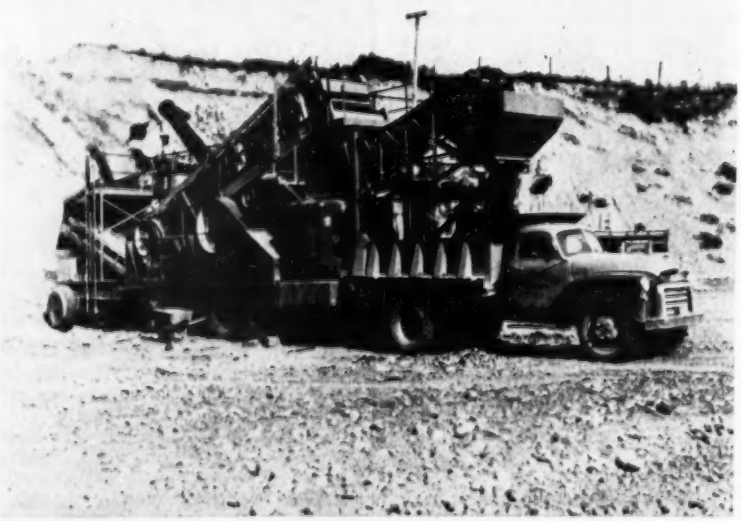
Intermediate: With the jaw set at 2 in., 46% of jaw throughs pass 1 in. (See chart, CM&E Nov. '56, p 164). This leaves 54% (100% minus 46%) of the jaw's product to be crushed by the intermediate. Because the jaw takes only 10% of the pit product, 5.4% (10% of 54%) of the total pit product must go from the jaw through the intermediate. In addition, the intermediate must handle the 10% of the pit that falls between 2 in. and 1 in. This gives a total of 15.4% (5.4% plus 10%) pit material going through the intermediate.

Final Reduction: With the jaw set at 2 in., 26% of jaw throughs will pass ½ in. (Nov. chart). That leaves 74% of the jaw's product to be reduced further. But 54% of the jaw throughs are handled by the intermediate. So only 20% (74% minus 54%) goes directly from the jaw to final reduction. That means that 2% (10% of 20%) of pit product goes through both jaw and final reduction.

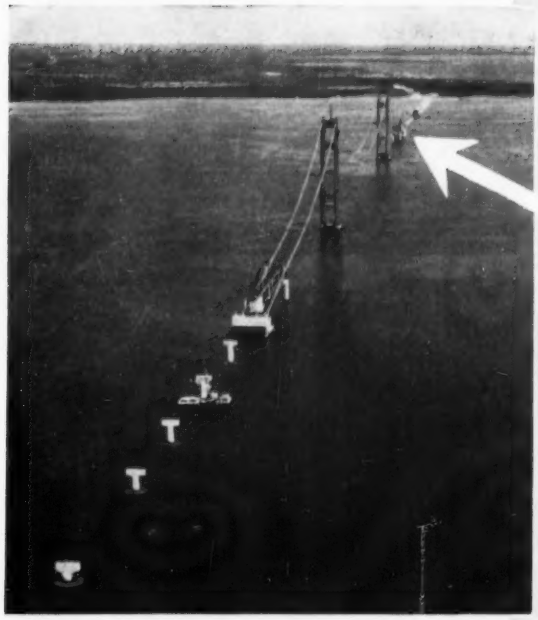
With the intermediate crusher set at 1 in., 46% of its product will pass ½ in. (Nov. chart). That leaves 54% of the intermediate product to be finally reduced. Since the intermediate handles 15.4% of pit material, 8.3% (15.4% of 54%) of the pit goes through both intermediate and final reduction.

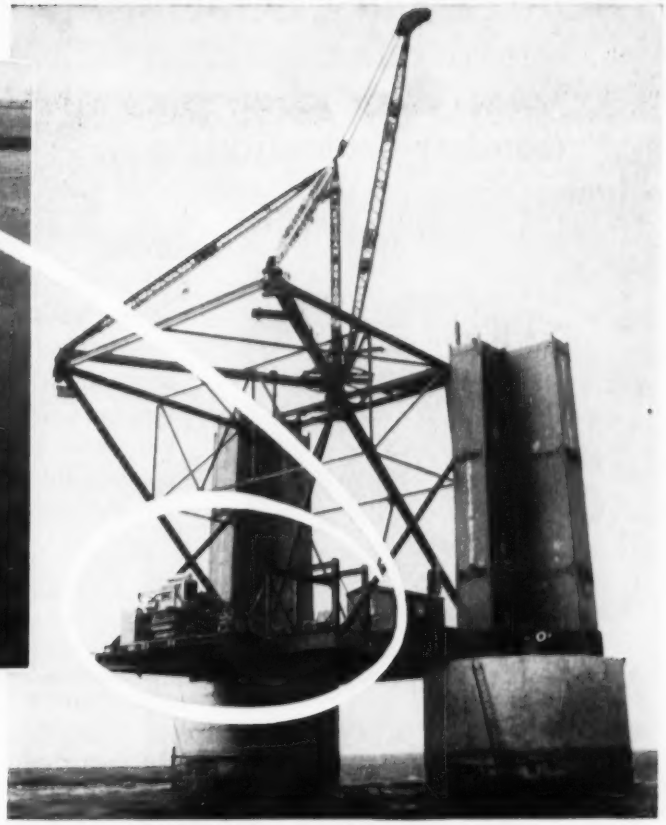
In addition, the final reduction crusher must handle the 10% of the pit falling between 1 in. and ½ in. Thus the total amount to be crushed in final reduction is 2% plus 8.3% plus 10%, or 20.3%.

continued on page 212



SELF-PROPELLED PLANT is unusual. While most duplex units have to be towed, this one can travel under its own power at speeds up to 18 mph. (Lippmann Engineering photo)





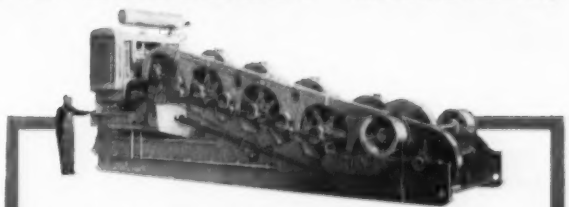
A wide range of sizes of Clyde Hoists are being used on the Mackinac Straits Bridge job, the world's longest suspension bridge. From small, 3,000 lb. line pull Frame-3 utility hoists to mighty Frame-8 hoists with 21,000 lb. line pull that operate the traveling derricks, the same, high standards of quality exist.

CLYDES HANDLE CONSTRUCTION MATERIAL ON WORLD'S LONGEST BRIDGE!

From the first preliminary engineering sketch to the traditional ribbon cutting ceremony that will open the Mackinac Straits Bridge to traffic, quality is a predominating factor. Quality in engineering . . . in workmanship . . . in materials and equipment is a necessity for the successful completion of any construction project.

For the utmost quality in hoisting equipment, Clydes are your best bet. Clyde hoists offer more design advantages than any other hoist in the field . . . advantages that assure safer, easier and more economical operation. Advantages that mean long life dependability and stamina for uninterrupted service, job after job, year after year.

Why not write for bulletins and find out for yourself why Clyde hoists excel?



CHECK THESE QUALITY FEATURES—

- Ball and roller bearings throughout reduce maintenance and power costs.
- Lock-in, lock-out pawls afford safer load handling.
- Internal, expanding band friction clutches give smooth, fatigue-free operation.
- Chain tightener permits fast, simple adjustment without removing guard.
- Easily actuated, generous size brakes assure positive, accurate load control.

HOISTS · DERRICKS · WHIRLEYS · BUILDERS TOWERS · CAR PULLERS · UNLOADERS · ROLLERS

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CLYDE IRON WORKS, INC.

Established in 1899

DULUTH 1, MINNESOTA

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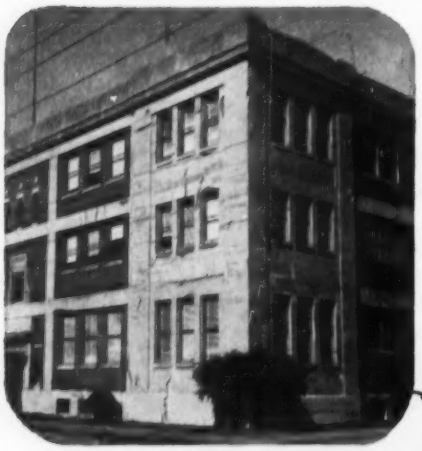
THORITE and THOROSEAL furnish office building with *That New Look* plus all-weather protection.

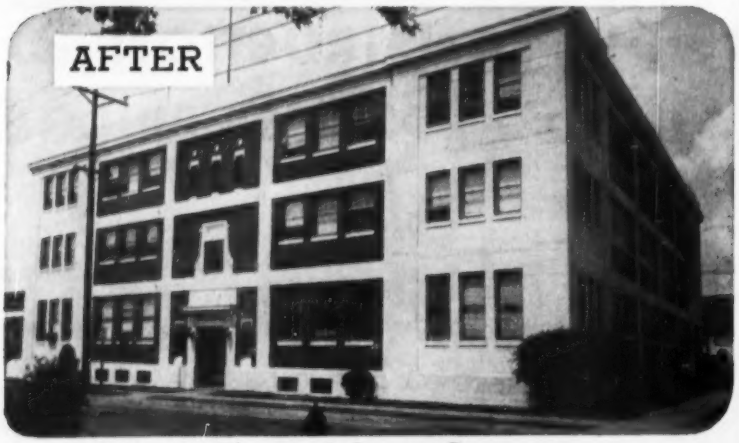


BEFORE

Severe weathering had deteriorated sections of cornices, sills, lintels and ledges. Cracks permitted water penetration, causing damage to interior of building.

All cracks were opened with hammer and chisel, spalled areas cut and cleaned, then patched with THORITE, followed by two brush coat applications of Pearl Gray THOROSEAL.

Brick was left uncoated to develop pleasing contrast. See Circulars No. 16 and 20.



Virginia Electric & Power Company
Richmond, Virginia

THORITE ***NONSHRINK PATCH*** 20 minute set patching mortar

THOROSEAL ***MASONRY SEALER*** seals masonry walls against water and beautifies surface

"How to do it" GET OUR 16 PAGE BROCHURE

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNA. CENTERVILLE, IND.

PRODUCING AGGREGATES . . . continued

Therefore, the relative amount of crushing done by each crusher is:

Primary (10%)	21.9%
Intermediate (15.4%)	33.7%
Final (20.3%)	44.4%
Total (45.7%)	100%

The percentage of ½-in.-minus material produced by each crusher is:

Primary	2.6% (26% of 10%)
Intermediate	7.1% (46% of 15.4%)
Final	20.3%
Total	30.0%

The advantage of the three stages in this case are obvious. Had only two crushers been used, with the jaw remaining set at 2 in., the reduction crusher would have done over three-fourths of the crushing and would have had to produce about 90% of the crushed material.

Need Pit Analysis

Assuming other pit conditions, one can develop a number of hypothetical situations regarding loads on crushers. However, it is always best to secure a reliable pit analysis for the computations even though, in the case above, we could operate in a considerably coarser pit without trouble. Whether we should have set our jaw crusher closer than 2 in. would depend on the capacity of the crusher to handle the tonnage fed it. In our problem, tonnages were not involved.

Had the percentage of plus 2-in. material been higher, the primary crusher would have carried a larger share of the crushing. And it is likely that the upper limit of the plant output, so far as crushing is concerned, would depend on the capacity of the primary crusher at the setting determined for the jaw. This is reasonable to assume because, in producing ½-in. material and maintaining a jaw setting compatible with the stages of reduction permissible at the intermediate and final reduction crushers, both of the latter would have ample capacity. For this reason it is good practice to select an intermediate crusher that will allow the largest possible setting of the jaw, yet one that has the capacity required to feed the final crusher enough material of a size it can handle.

There is a further factor to consider, of course, which is the

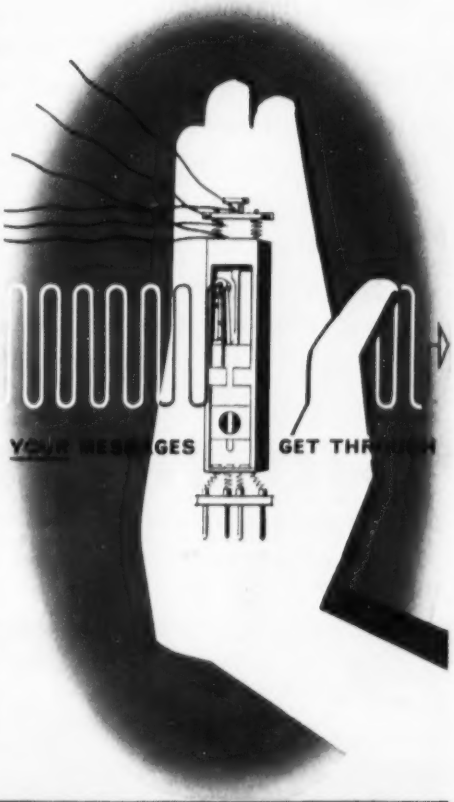
Triumph over Channel Chatter

with PRIVATE-LINE 2-Way Radio

GIVES YOU GREATER RANGE, MAXIMUM PROTECTION AGAINST NUISANCE AND SKIP INTERFERENCE

Truly a new dimension in two-way radio communications—the result of years of extensive engineering and "on-the-job" field testing. PRIVATE-LINE radiophone incorporates an entirely new circuitry concept which provides privacy from interfering signals and unwanted co-channel messages. Now you can "get off the party line." No longer is it necessary to listen to a constant stream of "channel chatter" over the loudspeaker. PRIVATE-LINE radiophone is *completely quiet* except when receiving a call from another PRIVATE-LINE radiophone in the same operation.

- **REDUCES MISSED AND MISUNDERSTOOD MESSAGES**—operators hear only messages within their own operation—minimizes confusion, inattention.
- **INCREASES OVERALL EFFICIENCY**—fewer errors mean more productive utilization of time—fewer repeat messages—more dispatched vehicles per hour...real advantages during peak load periods.
- **INCREASES AREA COVERAGE**—"coded squelch" circuit automatically maintains optimum receiver sensitivity, assuring maximum communications range at all times—prevents desensitization of the receiver by accidental or intentional misadjustment.
- **EASIER TO OPERATE**—no additional buttons, lights, adjustments or operational techniques—elimination of squelch adjustments makes PRIVATE-LINE even simpler to operate than conventional two-way radio equipment.
- **REDUCES OPERATOR FATIGUE**—elimination of "channel chatter" enables operator to concentrate on his job—reduces tension, providing a more pleasant atmosphere—increases job satisfaction.



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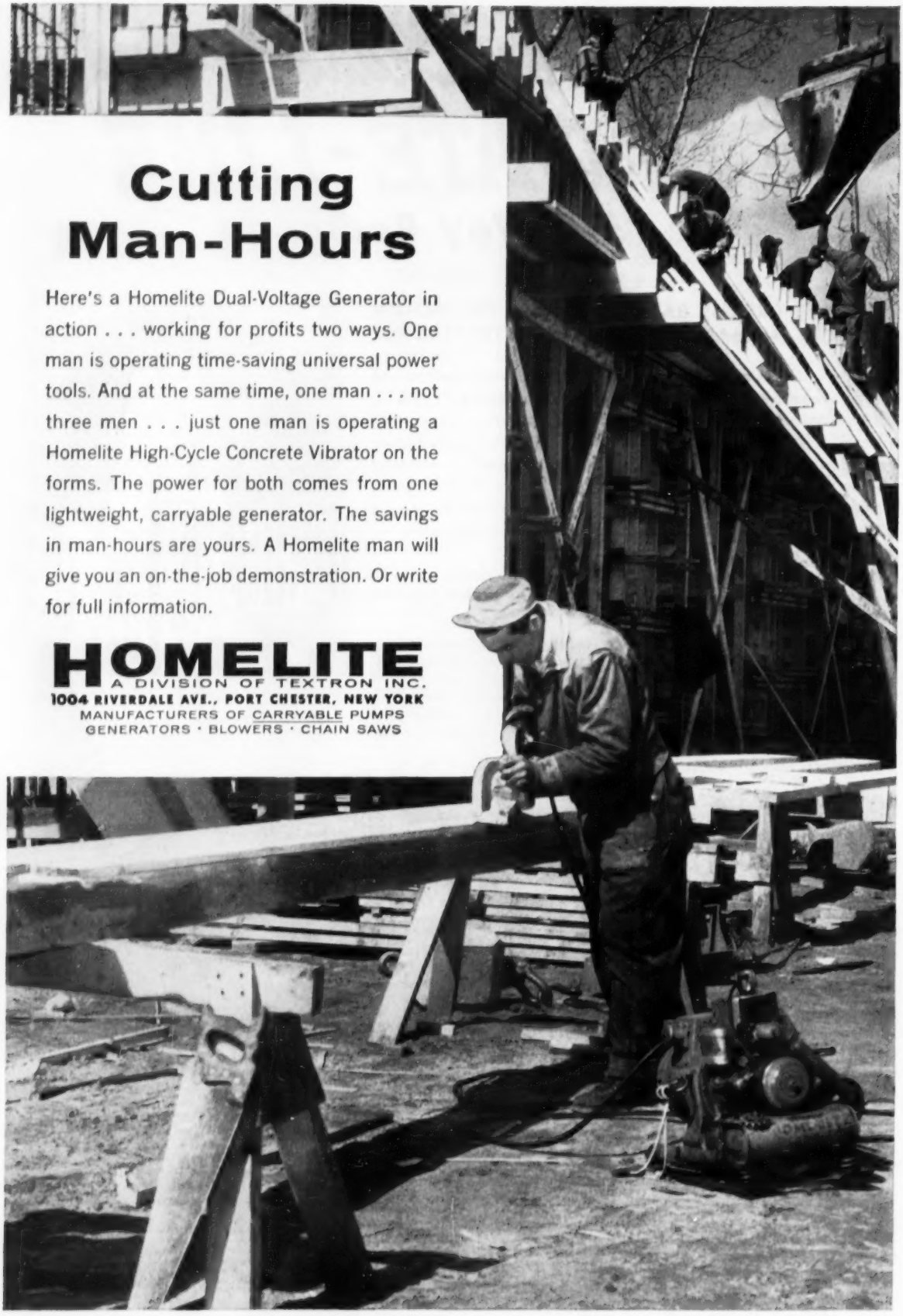
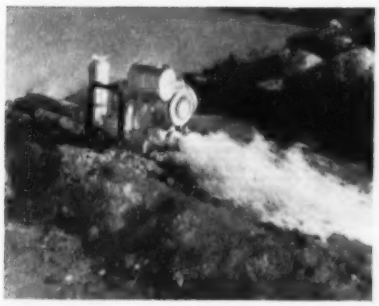


Cutting Man-Hours

Here's a Homelite Dual-Voltage Generator in action . . . working for profits two ways. One man is operating time-saving universal power tools. And at the same time, one man . . . not three men . . . just one man is operating a Homelite High-Cycle Concrete Vibrator on the forms. The power for both comes from one lightweight, carryable generator. The savings in man-hours are yours. A Homelite man will give you an on-the-job demonstration. Or write for full information.

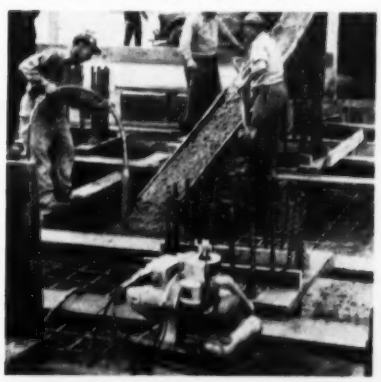
HOMELITE
A DIVISION OF TEXTRON INC.
1004 RIVERDALE AVE., PORT CHESTER, NEW YORK
MANUFACTURERS OF CARRYABLE PUMPS
GENERATORS · BLOWERS · CHAIN SAWS

Full Line of Carryable Construction Equipment Now Offered by Homelite



Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".

Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators *and* 110 volt DC for all universal vibrators, tools and floodlights.

HOMELITE

a division of Textron Inc.

PORT CHESTER, NEW YORK

PRODUCING AGGREGATES . . . continued

screening capacity at the various stages. It may be that some over-run on the intermediate plant screen can be tolerated, because of the capacity of the intermediate crusher to handle this over-run. But an over-run on the final sizing screen can be a serious threat to maximum plant output. One way of relieving this situation is to take off a portion of material to size, or even smaller material, at the intermediate plant. This can then be blended back into the product from the sizing screen without further passage through the plant. This is also one method of helping control gradation of the final product because the blending can be done in proportion to need.

Chip Production

Where it is desirable to separate pit-run from crusher-run material, this can be handled at the scalping screen on the primary. In a primary having the screening features shown in Fig. 10, this kind of separation is readily possible. Likewise, with this type plant, a plate can be substituted for the bottom deck mesh to save all the fines.

While in most cases it usually is better practice to produce chips as a separate operation, production of some chips can be accomplished between the top deck and the carry deck on the final reduction plant diagrammed in Fig. 14. If pit run material is mixed with crusher run, however, not all the chips size material will be fractured.

Should it be necessary to manufacture sand because of a shortage of fines in the product, the material removed at the intermediate plant can be run through a separate set of rolls and screen (or through a hammermill, where permissible) and the sand thus produced can be blended into the product as required.

As to mobility of connecting conveyors between plants, consideration should be given to the alternatives of loading these on trucks

Prestressed Concrete

Reprints of CM&E's special report on Prestressed Concrete now are available. Single copies, 35¢; in orders of 10 copies or more, 25¢ each. Address your order to the editor, 330 W. 42nd St. New York.

Use REMA to add years of life to your Belts

REMA
is the New and Amazing Self-Vulcanizing Rubber Repair Material

REMA
REQUIRES
- NO HEAT
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- NO CURING TIME DELAY

• REMA is not just another cold patch. REMA is vulcanization by chemical process. The repaired area is sealed with an abrasive resistant cover stock patch. No heat or heavy vulcanizing equipment required. Here's the astonishing advantage—*when repair work is completed belts may be returned to service immediately.*

• REMA seals out moisture, reduces mildew, rot and deterioration — the great enemies of conveyor belts. Your own maintenance man can quickly repair your belt — it doesn't take a skilled belt mechanic to use REMA.

• Used for repair of all types of damaged spots, edge wear and for covering metallic joints. Available in introductory kits or parts separately.

Order from your Flexco-Alligator distributor

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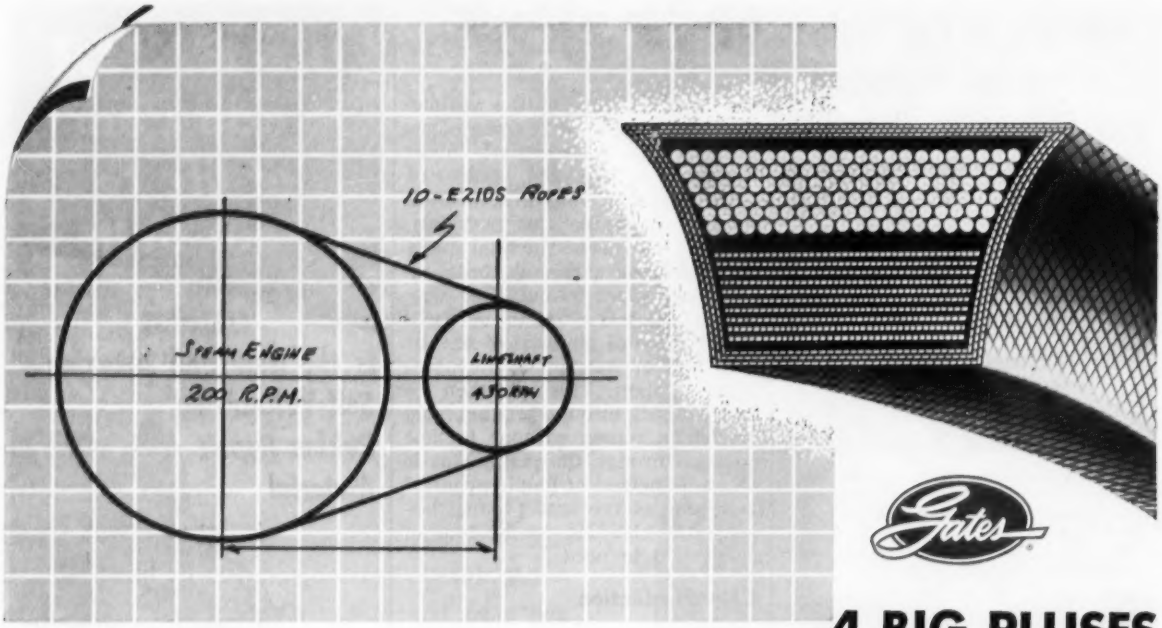
REMA SELF-VULCANIZING
RUBBER REPAIR MATERIALS



MORE HP DELIVERED PER $ INVESTED

On any new drive design—where you have limited space or you need to keep weight down—here is an important fact that can save you money:

A Gates Super Vulco Rope drive will deliver more horsepower per dollar invested than any standard V-belt drive.

Actually, the greater load carrying capacity of Super Vulco Ropes cuts down the number of belts required (5 Super Ropes do the work of 7 standard belts) . . . thus reducing the width of sheaves.

Sheaves with fewer grooves not only cost less, they weigh less, and take up less room—advantages that can easily improve the design and lower the overall cost.

A wealth of drive data is quickly available to you. Simply call your nearby Gates V-Belt Distributor (see 'phone book yellow pages) for a Gates V-Belt Specialist. Stocks available in industrial centers around the world. The Gates Rubber Co., Denver, Colorado—*World's Largest Maker of V-Belts.*

4 BIG PLUSES

✚ Handles shock loads

Super-strength cords provide 40% greater horsepower capacity . . . easily absorb heavy shock loads.

✚ Wears far longer

Concave Sidewalls (Fig. 1) increase belt life. As belt bends, concave sidewalls (U.S. Pat. No. 1813698) become straight, make uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt . . . longer V-belt life.

Flex-Weave cover (U. S. Pat. No. 2519590) provides greater flexibility with far less stress on fabric. Cover wears longer—increases belt life.

✚ Provides Static Safety

High electrical conductivity is built into Gates Super Vulco Ropes for safer drives (in explosive atmospheres).

✚ Resists oil, heat and weather

Special rubber compounds with which cords and fabric are impregnated make Super Vulco Ropes highly resistant to heat, oil and prolonged exposure.

TPA 76B

Gates Super Vulco Rope Drives

for transport, or of using conveyors already mounted on their own wheels. Portable conveyors are more readily moved by towing, of course, leaving the contractor's regular transport trucks free for hauling other items in the setup.

If the finished product is being trucked away as fast as it is made, bins will be required as temporary storage while trucks pull in and out. Some operators use portable bins for greater mobility. Where stockpiles are made, it is frequent practice to bulldoze material away from the plant. Other setups call for portable conveyors to handle the stockpiling. Traps for dozer feeding have been made portable, too, in various styles. Portable field offices and portable maintenance shops are adding to the mobility of many contractors' "tools of the trade."

In the light of the foregoing it is obvious that the portable plant will play an increasing important role in the building and improvement of the nation's highways for a good many years to come. It will be, in fact, a necessary adjunct to the many stationary or commercial plants whose output also will be required to keep pace with the goals set.

The next article in the series on Producing Aggregates will discuss washing plants.

PORTABLE UNITS of all types are available. At top, impact-breaker primary, hammermill secondary, screening unit, and 10-yd bins are all on wheels. Directly above, jaw primary, twin-jaw secondary, and cone-type final reduction unit work together. (Iowa photo)

PORTABLE CONVEYORS are among the key items of equipment for a unitized or combination plant. This type is fitted with its own wheel trucks so it can be towed when plant is moved. Other types are loaded onto haul trucks for moving. (Pioneer photo)

Ideas For Earth

TWIN-POWER SETS NEW ON SCORES OF JOBS

Gives production not offered by

New "Euc" has struck capacity of 24 yds.

This Model TS-24 is Euclid's latest development in Twin-Power Scrapers. It has a struck capacity of 24 yds. and 32 yds. heaped at 1:1 slope. Tractor is powered by 300 h.p. engine with 3-speed Torqmatic Drive. The rear axle is driven by a 218 h.p. engine with separate torque converter and semi-automatic transmission. Hydraulic steering provides full 90° turns. Tires are 27.00 x 33 standard with 33.5 x 33 optional. Top speed with full payload is 26 mph. using standard size tires.

Pipeline Padding Costs Reduced More than 50%

ARIZONA — Western Pipe Line, Inc. of Austin, Texas is laying 245 miles of 34" pipe across northern Arizona and a 141 mile connection of 20" pipe to Phoenix. It's a tough job across rugged terrain and requires equipment that can take steep grades and rough going.

The pipe must be protected with a 6" blanket of selected material—about one yard of dirt per lineal yard of pipe. Two "Twin" Scrapers have been working on the padding operations hauling material from 1200 ft. to several miles over grades as much as 39%. The contractor reports that the production and work-ability of these scrapers have cut padding costs in half as compared with former methods used.

Rush Job Finished 4 Months Ahead of Schedule

SOUTH DAKOTA—J. H. Beckman Construction Co. of Sioux Falls was awarded a grading contract for 6.8 miles of U. S. Route 16 that involved 360,500 yds. and had to be completed in 6 months. Four Euclid Twin-Power Scrapers, supplemented by 3 other scrapers, some crawler equipment and 3 motor graders, were put on the job and worked 11 hour shifts six days a week.

Because of their Twin-Power and all-wheel drive, the "Eucs" worked independently without assistance from pusher tractors. On one cut they self-loaded 20 bank yards of gumbo and shale in about 45 seconds — completed the 870 ft. haul cycle over cut and fill in an average of 2.83 minutes. Hourly production was 353 yards. Self-loading sand and top soil in another cut the Euclids averaged 21.6 yards in less than a minute. The complete 600 ft. cycle took about 2½ minutes and hourly production averaged 415 bank yards.

With these versatile, fast dirt-movers on the job, grading was completed far ahead of the rush schedule.

Versatility Pays Off at Noxon Rapids

MONTANA — Two Twin-Power Euclid Scrapers are being used by Morrison-Knudsen Co., Inc. at Noxon Rapids Hydro-electric Project on the Clark Fork River in Western Montana. They are building roads, helping with excavation at the dam site and supplementing a large fleet of other Euclid hauling equipment.

Working in heavy wet clay or in sand and gravel the "Twins" pick up loads of 18 yds. or more without help from pusher tractors. With big single tires and all-wheel drive, they work in soft and rutted areas and have plenty of power to move heaped loads over long hauls at fast travel speed.

Owner says "Euc" Twin-Power Scrapers have revolutionized dirt moving in the West

SOUTH DAKOTA — Harris Construction Co. moved 1,000,000 yds. of shale for a railroad relocation job at Mowbridge with only 6 scrapers one motor grader and one roller. That's probably as small a spread of equipment as you'll ever find on a project of this size yet production averaged 13,000 yds. per 10-hour shift. Cycle time on a 1600 ft. haul was about 4 minutes . . . each "Twin" averaging 225 yds. per hour. Owner Ken Harris has found the Twin-Power Scraper the most efficient dirt mover he's ever used and this railroad job wasn't the first time he had parlayed Twin-Power into low cost high production.

In April of 1956, Harris set a new earthmoving record on Montana highway work by moving 90,000 yds. on hauls up to 4000 ft. during six 10-hour shifts. At the same time he was working on the road job, Harris had a 1,200,000 yd. subcontract at Glasgow Air Base, 26 miles away. He moved his "one man earthmoving crews" from one job to another according to weather conditions and work requirements. The "Eucs" were used to the best advantage all the time because there was only an hour's travel time involved and they worked independent of pusher tractors normally needed by scrapers for efficient operation.

3 Million Yard Waste Dump Moved by "Twins"

ONTARIO, CANADA — Moving an old waste dump from a drained lake bed presented a tough problem for Steep Rock Iron Mines, Ltd. The material, consisting of wet silt, low grade ore, stone and boulders, was heavy—about 3200 lbs. per yard. Hauling conditions were difficult because of the soft, spongy footing so it seemed that the job would have to be truck-shovel operation. In spite of these adverse conditions, a Twin-Power Scraper was demonstrated on a haul of 5800 ft. round trip with grades up to 10%. Performance was so outstanding that four machines were purchased and are now effecting major savings on an almost "impossible" scraper job.

Twins Tackle Tough Road Job

VIRGINIA — Contractor Robert T. Main used a Twin Scraper and TC-12 Crawler in a highway cut that had stopped other scrapers because of the extremely soft footing. This combination of Euclid "Twins" had plenty of power, traction and flotation to get the job done efficiently—it replaced a dragline that was brought in when it looked like the job couldn't be done by scrapers.

movers

TWIN EDITION ★ ★

RECORDS

and cost advantages any other equipment

Improved Model of "World's Most Powerful Crawler"

Euclid's Model TC-12 Twin Crawler now has more horsepower, more track area and more accessibility than any other production tractor. It is powered by two 218 h.p. engines with separate Torqmatic Drives for each track—a total of 436 h.p.! Standard shoes are 27" wide and there are now 8 track rollers to give still better balance with heavy duty attachments.

Ten "Twins" Move Nearly 40,000 Yds. Per Day

NEBRASKA — Western Contracting Corp. of Sioux City, Iowa, used 10 "Twin" Scrapers and 5 Euclid TC-12 Crawlers to move 3 million yards on a plant site grading project with a 5 month completion limit. Equipped with 6 yard sideboards and push loaded by the big "Twin" Crawlers to get maximum production, the scraper fleet worked 20 hours a day and moved close to 40,000 yds. daily on hauls of 1500 feet.

This leading contractor's belief that Euclid Twin-Power is tops for low cost earthmoving is backed by lots of previous experience on high production jobs. At Ft. Randall Dam they used a fleet of 30 Model LLD 50-ton Rear-Dumps powered by two 300 h.p. engines. For a 7 million yd. Indiana Turnpike contract Western purchased 15 Twin Scrapers and 5 Model TC-12 Euclid Scrapers. After finishing this big job, part of the Twin fleet was assigned to Oahe Dam while others tackled a highway project in Michigan. This well-known contractor is so "sold" on Euclid Twin-Power Scrapers and Crawlers that estimates and bids are made on the basis of the low cost production that "Twins" provide.

Couldn't Believe His Own Stop-Watch

IOWA — When a contractor-visitor to Wilbur Nielsen's road grading job made a time check on 3 Twin-Power Scrapers he sent to town for another stop-watch because he couldn't believe the time registered on the one he'd used!

The "Twins", equipped with 6 yd. sideboards and push loaded by a torque converter crawler tractor, got loads of better than 24 yds. in an average of 50 seconds. In spite of the mile and a half long haul, the three scrapers averaged 336 yds. per hour. Working 10½ hour shifts six days a week, with an availability record of 95%, Nielsen's "Eucs" completed the grading well ahead of schedule.

"TWINS" are making headline news!

Twin-Powered Euclid Equipment is out-performing all other equipment by a wide margin — the profit margin — on all kinds of earth-moving. With "Twins" in your fleet you'll have a bidding advantage that can pay off in more jobs and more profit. Get the facts from your Euclid dealer and you'll know why owners everywhere have proved Euclids are your best investment.

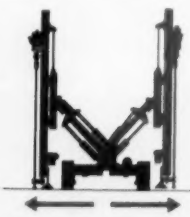
EUCLID

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Announcing the

A Completely New, Crawler Drill at its

NO OTHER CRAWLER DRILL SO COMPLETELY POWERED... SO FAST AND EASY TO SET UP... SO SAFE TO OPERATE!



1. Hydraulic Boom Swing of 9'11" gives maximum usable hole pattern with a single crawler setup and permits line hole drilling along a face over the tracks.

MAXIMUM FLEXIBILITY WITH COMPLETE SAFETY

FOR A PACE-SETTING DRILLING COMBINATION,

Ingersoll-Rand

CRAWL-IR

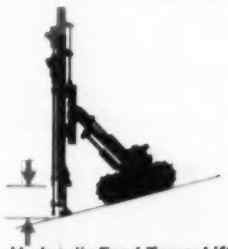
Completely Mechanized

RUGGED BEST!

2. Hydraulic Boom Lift raises and lowers booms in vertical plane—covers distance of 7'3" with tower in horizontal position.

3. Hydraulic Feed-Tower Tilt sets feed tower **at any angle.**

4. Hydraulic Feed-Tower Swing sets tower for vertical drilling on any slope—or positions drill for horizontal holes at any angle to crawler travel.



5. Hydraulic Feed-Tower Lift slides feed tower up or down, in or out—permitting foot pad to be set firmly on the ground.

HERE, in one unit, is a completely mechanized and self-propelled heavy-duty crawler drill that will greatly expand the scope of Wagon Drill operations. With *all* boom and feed-tower adjustments hydraulically controlled, you can make faster, safer and easier setups for drilling in *any position.* And because the CRAWL-IR can tow its own portable compressor, you save manpower and release auxiliary equipment generally required to move drills and compressors on the job.

The following advantages and features make this the fastest-acting, easiest drilling and safest unit of its type ever developed. It can be supplied with percussion or rotary drills, and with a wide range of optional hydraulic combinations when all of the power features are not required. Ask your I-R representative for complete information on this new self-propelled blast hole drill—or send for a copy of Bulletin No. 4189.

ADVANTAGES

SELF-PROPELLED – The CRAWL-IR is powered by two independently controlled heavy-duty piston type I-R air motors. Knee-action frame construction permits these motors to take the crawler over rugged terrain.

SPEEDS SETUPS – Five hydraulic cylinders quickly and safely position and lock the feed-tower in position by manipulation of convenient controls located on the boom base.

FAST STEEL HANDLING – Reverse rotation in the powerful D-45 drill when used with coupled steel provides a convenient and easy method of adding and removing steels in a hurry. The D-45 also incorporates release rotation which permits hammer action on the steel for loosening joints and fighting stuck steels.

MORE DRILLING TIME – The bulk of the time formerly spent on conventional Wagon Drills in moving, hand wrench time and steel handling is now turned into drilling time. With the drill positioning completely mechanized one man operation is entirely feasible.

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Special bodies fit readily
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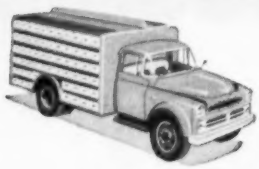

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. . . In every weight class

Dodge Power Giants give you an extra bonus of power.

From 204-hp. pick-ups to 232-hp. tandems, Dodge V-8's outpower the "other two" by as much as 31%. This extra power reduces engine strain, saves wear. What's more, Dodge engines, both V-8's and 6's deliver full power on regular gas.

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Collect Your Extra Dividends
April is Extra-Dividend Month

Get *extra dividends* in power, *extra dividends* in payload, *extra dividends* in performance . . . plus a special *extra-dividend* deal on a new Dodge *Power Giant*.

DODGE TRUCKS WITH THE *FORWARD* LOOK

Construction Men in the News . . .

CLAUDE F. HORTON is new assistant to S. V. "Sammy" Collins, President, Collins Construction Co., pipeline contractor of Port Lavaca, Tex. He will work with Collins on contract negotiations. Horton also has been named executive vice-president and director of Construcciones Collins de Venezuela, a subsidiary. He has been in construction since 1930. He formerly was vice-president of Brown & Root, Inc., where he headed all pipeline construction.

W. HURD MANAHAN is new vice president in charge of construction for Brown & Root, Ltd., of Edmonton, Canada. Manahan has been associated with Canadian oil and chemical plant construction since 1953 when he was assistant general superintendent for Brown & Root on construction of the Canadian Chemical Co. plant at Edmonton. He is a graduate of Texas A&M College and has been associated with large construction projects both in Canada and the United States since 1942.

HERBERT C. SAVIN has been elected a vice president of the Merritt-Chapman & Scott Corp. Construction Department.

Savin, second member of the family to be named an MC&S officer, has been a vice president for the past eight years of The Savin Construction Corp. of East Hartford, Conn. The Savin Corp. now operates as part of MC&S's Construction Department.

Savin's father, A. I. Savin, founder and president of the firm, has been an MC&S director since September, 1955, and a vice-president since November 1955.

KENNETH F. GOODSON is resident manager for Henry J. Kaiser Construction Co. at Ravenswood, W. Va. He will be responsible for construction of a $200 million Kaiser Aluminum & Chemical Corp. reduction plant and rolling mill there.

Before joining Kaiser, Goodson was general manager for Hedrick-Grove during construction of the NATO air base at Keflavik, Iceland. Earlier, as partner in the Vinson Construction Co., he supervised construction of pipeline suspension bridges crossing the Colorado River at Yuma and Parker.

Before this he was vice president of E. V. Lane Corp. where he was responsible for highway and road construction, industrial pipelines, and underground pumping stations in Okinawa and Japan.

JOHN L. TISHMAN and **EDWARD S. TISHMAN** are new vice presidents of Tishman Realty & Construction Co. of New York City. John L. will be in charge of construction while Edward S. will be assigned to management.

A graduate of the University of Michigan engineering school, John L. has been vice president of various Tishman construction subsidiaries since 1948. He served during World War II as a naval officer.

Edward S. has been with the organization since 1947. He entered property management as district manager in 1950 and was named the firm's general manager in 1951.

C. D. HANBY is the newly-elected president of the National Constructors Association, a group specializing in the design and construction of chemical plants, petroleum refineries, steel mills, and power plants. Hanby is vice president of the Rust Engineering Co. Carl B. Whyte, president, Procon, Inc. of Des Plaines, Ill., is the new vice president.

FRANKLIN T. MATTHIAS, Army engineer on the Hanford, Wash., atomic project during World War II, is new chief engineer for the Aluminum Co. of Canada, Ltd.

Matthias will be in charge of all construction for the company. This includes the large expansion of primary aluminum production facilities at Kitimat, British Columbia, and the building of a new 1,000,000-hp hydroelectric development at Chute-du-Passe, Quebec.

Continued on next page

SMITH

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FEATURES

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THREE SIZES 1½, 3 and 6 TONS

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CONSTRUCTION MEN ...
Continued

As a 36-year-old colonel in the United States Army Engineers, Matthias won a Distinguished Service Medal for his work on the Manhattan Project atomic plant at Hanford. Operating under the tightest wartime security, Col. Matthias supervised the selection of a 600-sq. mi. site and the building of the plant in less than two years. He then became commanding officer of the project and its 45,000 personnel.

After the war he joined the Brazilian Traction Co. In 1952 he joined Aluminum, Ltd., as assistant manager of the Alcan Kitimat project. This involved damming the Nechako River, drilling a 10-mi tunnel through a mountain, constructing a powerhouse inside the mountain, stringing a 50-mi powerline, and building an aluminum smelter and a town at Kitimat.

With the Corps of Engineers . . .

COL. ALDEN K. SIBLEY becomes New England Division Engineer in April succeeding BRIG. GEN. ROBERT J. FLEMING, JR. Sibley's headquarters will be in Boston, Mass.

COL. WILLIAM P. JONES, JR., now attending Harvard University's Advanced Management Course, becomes District Engineer, Memphis, Tenn.

COL. EVERETT A. HANSEN, the Engineer Comptroller since Dec. 1955, becomes District Engineer at Galveston, Tex.

COL. DAVID G. HAMMON, now attending Army War College at Carlisle Barracks, Pa., succeeds COL. THOMAS J. HAYNES, III, as Omaha, Neb. District Engineer.

COL. CARROLL T. NEWTON, now attending the Industrial College of the Armed Forces, becomes District Engineer, Los Angeles, Calif., succeeding COL. ARTHUR A. FRYE, JR.

COL. WALTER J. WELLS, now attending Army War College, becomes District Engineer, Fort Worth, Texas, succeeding COL. HARRY O. FISCHER.

Col. THOMAS D. ROGERS, district engineer at Savannah since July, 1954, succeeds Col. JOHN T. O'NEILL as district engineer, New York City. O'Neill has been in N.Y. since 1954 and goes to Army Forces, Far East.

PUMP SELECTION AND APPLICATION

How to size up pump requirements in a score of industries, how to understand pump performance, how to plan pumping installations for maximum economy of operation, and how to modernize existing installations, are some of the problems thoroughly treated in this book. **By Tyler Hicks, Special Projects Editor, Power. 432 pages, 411 illustrations, $8.50.**

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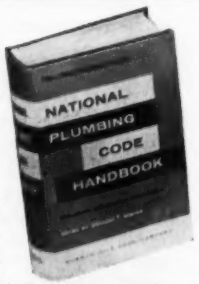
Based on 1956 National Electrical Code. Practical methods of electrical wiring, explained in plain, easy language. Provides hundreds of on-the-job tips and shortcut suggestions. Tells how to do all kinds of light and power wiring (under 600 volts) on the farm, in homes, factories, schools, stores, etc. **By H. F. Richter, Member, Int'l. Assoc. of Elect. Inspectors. 602 pp, 468 illus., $6.75.**

NATIONAL PLUMBING CODE HANDBOOK



Offers a clear, simple guide to the National Plumbing Code, explaining and illustrating its meaning and intent, paragraph by paragraph, and including much related technical information and data to aid in the design and installation of plumbing, water supply, sewage, and drainage systems that will meet Code standards. **V. T. Manas, Editor. 503 pp., 389 illus., $7.50.**

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Brings you helpful guidance in choosing the kind of engineering career in which you will be successful. Plainly and thoroughly explains the scope of each engineering branch, the kind of work involved, the chief accomplishments of each, income and job possibilities, and gives pointers on preparing for such a career. **By C. C. Williams. 3rd Ed. rev. by E. A. Farber, U. of Fla. 297 pp., 60 illus., $4.75.**

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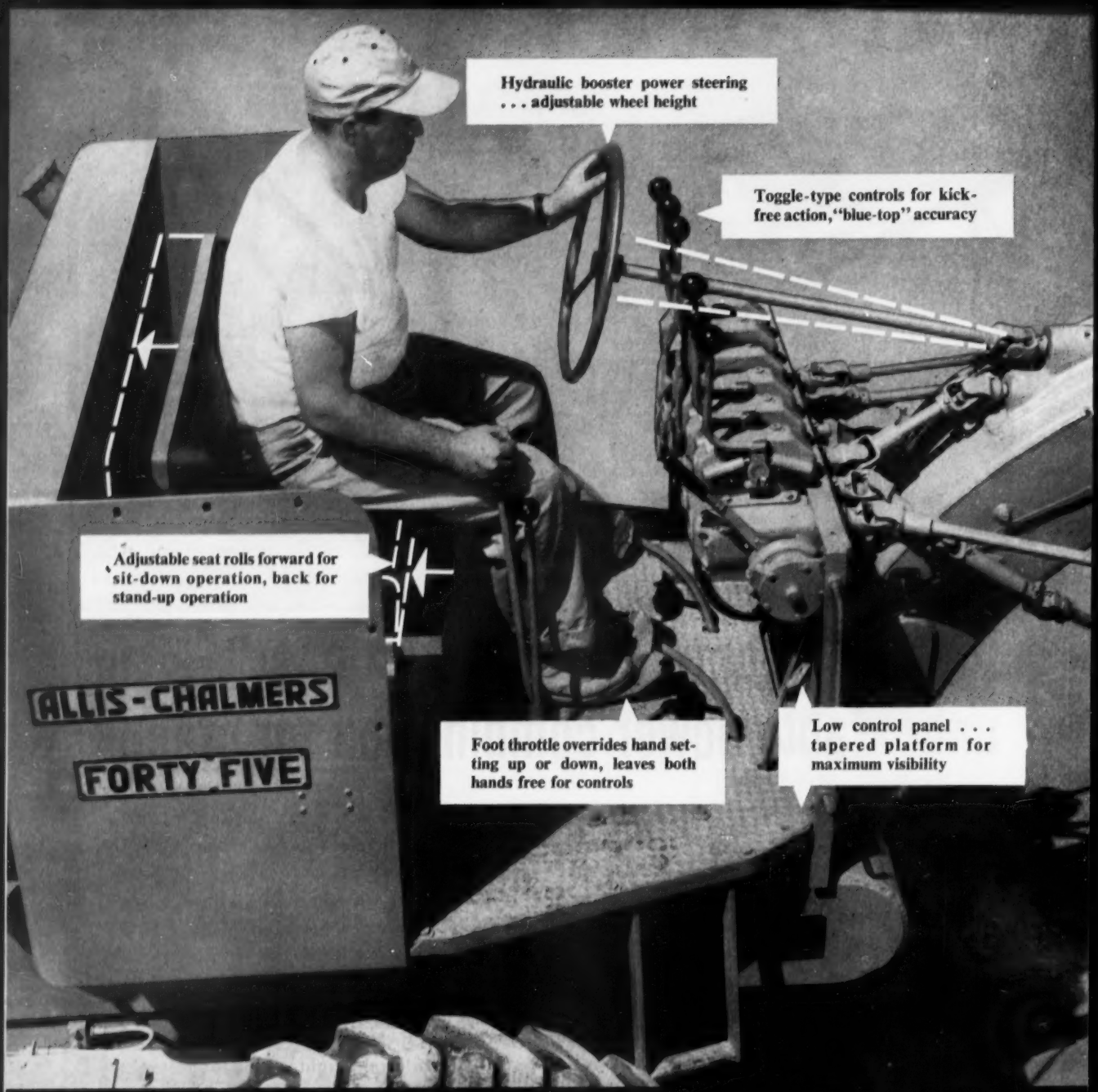
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. . . through operator comfort and control!

Features like these make satisfied operators . . . mean more production for you. They're yours in an Allis-Chalmers FORTY FIVE—120 brake hp, 23,800 lb. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

All About Spark Plugs

DESIGNERS are creating more powerful internal combustion engines today by raising compression ratios so that engines demand fuels with higher octane ratings. Because of the increased pressures present in the combustion chambers of high compression power plants, the functions of the spark plugs become increasingly important to the overall performance of the engines.

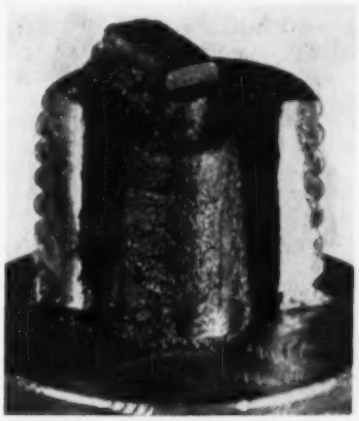
The spark plug must perform two important jobs: (1) it conducts the high tension electric current of the ignition to the inside of the engine combustion chamber; (2) it provides a pair of properly spaced electrodes between which the electric current can spark and ignite the fuel mixture.

A plug that can adequately perform these functions provides a hot spark that assures the best use of fuel in the combustion chamber. The results are maximum power output, better acceleration, and faster starting. On the other hand, the continued use of worn, dirty, or damaged plugs means generally faulty engine performance and a waste of fuel.

In order to insure good engine performance, spark plugs must be removed periodically from the engine for conditioning. The AC Spark Plug Div. of General Motors Corp. suggests that plugs used in normal service should be cleaned, inspected, and regapped every 3,000 to 5,000 mi and that new plugs should be installed every 10,000 mi.

AC points out, however, that these recommendations apply to plugs that are used under *normal* operating conditions. Engine manufacturers necessarily must recommend a plug type that will handle the normal service for which the engine is designed, but plugs chosen for average conditions may not operate satisfactorily at sustained high speeds, with abnormally heavy loads, or under continual stop-and-go driving.

To give good performance under a specific operating condition, plugs must operate within a certain temperature range. If a plug remains too "cool," oil, soot, carbon,



OIL FOULING—*Wet, black deposits on the firing end of the plug indicate that the engine is suffering from an oil pumping condition. Worn piston rings, pistons, or cylinders; sticky valves; or a faulty ignition supply are some of the more frequent causes. In most cases, plugs suffering from this damage will be serviceable after they are properly cleaned and regapped.*

OIL FOULING—*Another type of oil fouling results in the deposit of hard, black carbon on the plugs. This results from using a plug that is too "cold" in an oil-burning engine. A hotter-type plug should be used. If the condition persists, even after the plugs have been changed and the engine has been tuned-up, it would indicate the need for a general engine over-hauling.*

GAS FOULING—*Fluffy, dry, black carbon deposits indicate the fuel mixture is too rich. This can happen during the breaking-in period of a new engine or when an engine is constantly idled. Other causes are faulty automatic choke or carburetor misadjustment. Clean and regap the plugs and adjust the fuel mixture. If fouling persists, a hotter type plug should be used.*

LEAD FOULING—*Red, brown, yellow and white lead deposits on the insulator come from the additives in modern fuels and lubricants. These deposits will not affect engine operation while they remain powdery, but under high speeds or big loads they form a shiny coating that causes the current to follow the deposits and the plug is shorted. Cleaning will lessen this damage.*

or lead compounds may form, and this can result in missing or fouling. If the plug runs too "hot," the deposits accumulated on the insulator surface during continuous slow or stop-and-go driving may blister, electrodes will wear abnormally, and premature ignition of the fuel mixture will result.

AC and other spark plug and engine manufacturers make available to service shops charts that indicate the proper type of plug to use for each engine. Under normal conditions, proper operation is assured by choosing a plug that meets these temperature ranges. Under abnormal operating conditions, chronic carbon deposits or oil fouling will indicate that a hotter-type plug than was originally recommended is necessary. When pre-ignition or rapid electrode wear is experienced, a cooler plug will generally be found more satisfactory.

When a plug is removed, inspection should cover the appearance and condition of both ends of the insulator, the electrodes, the seat gasket, and the shell of the plug. To the trained eye, the effect of engine operation on any one of these components generally gives some indication of how efficiently the engine has been operating.

In some cases, the proper cleaning and regapping of dirty plugs or the installation of new ones to replace those that have worn out is all that is required to improve engine performance. However, spark plugs are often blamed for trouble that they do not cause. The same type and make of plugs, used in two engines of the same make and model, may show wide variations in appearance when inspected.

The cause of such differences lies in the condition of the engine, its piston rings, carburetor setting, the type of fuel used, and the conditions under which the engine is worked. The difference in the appearance of plugs, therefore, would indicate that there are times when the spark plug is not the cause of engine trouble, but rather a barometer of such trouble.

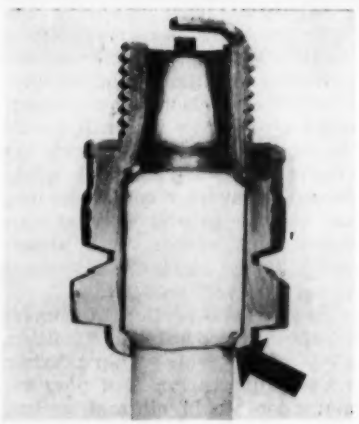
Replacement of old plugs with new ones generally will improve poor engine performance temporarily, but this is not a permanent cure for an engine with worn rings or cylinders, weak coils, faulty carburetion, or other engine troubles.

continued on page 230

WORN ELECTRODES — *When the electrodes show appreciable wear at low mileage, it usually indicates (1) that the engine is operating at speeds or under loads that are greater than normal; (2) that the wrong type of plug (too hot) is being used. Plugs with thin electrodes may fire at average engine speeds, but at top speeds they are not effective. They should be discarded.*

WORN INSULATOR TIP—*Plugs should be cleaned and regapped at least every 3,000 mi (more often under bad operating conditions), but there is a possibility that excessive blast cleaning will wear down the insulator tip. Depending on the type of cleaner used, the cleaning blast should not be held for more than 3 to 5 sec at a time. If the tip shows wear, discard plug.*

BROKEN LOWER INSULATOR — *This failure, which is generally visible after a plug has been cleaned, is usually caused by bending the center wire when adjusting the gap. It can also happen when the gapping tool is allowed to exert pressure against the tip of the center electrode or insulator when bending the side electrode to adjust the gap. Plug must be discarded.*



BROKEN UPPER INSULATOR — *Careless removal or installation of the plug will cause the upper insulator to crack, and the spark will be transmitted from the center electrode through the fractured insulator to the shell crimp. This is often confused with flash-over. Frequently, the crack may be only a hair-line fracture that will be hidden by the gasket shoulder. Discard plug.*

TYPICAL WORK BULL PACKAGES: 42-hp Davis Pit Bull at left using 7/8-yd. bucket to clean up spill . . . 34-hp Work Bull Model 202, center, with auger digs holes for retainer posts. And, at right, 52-hp Work Bull Model 404 handles earth-loading with direct-thrust 3/4-yd. loader. Hydraulic back-hoe handles 12 to 36" buckets.

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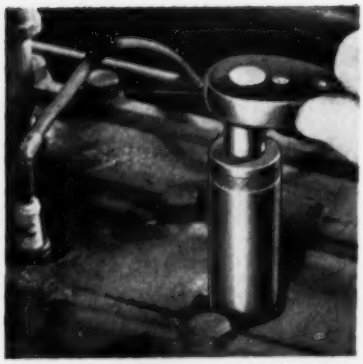
How to Service Plugs

THE FOLLOWING are AC Spark Plug Div.'s recommendations for removing, inspecting, cleaning, and installing spark plugs:

Before removing plugs, it is good practice to clean the area around the plugs to keep dirt from entering the cylinders when they are removed. When taking off plug wires, be careful not to jerk them free because this might separate the lead wire from the cable terminal.

When removing plugs from the engine, use only the proper size deep socket wrench and make sure it fits snugly over the hex of the plug shell. Otherwise the wrench may tilt or slip and break the insulator. An open-end wrench is not recommended.

Turn the plug counter-clockwise to remove it. Be sure to take out the gasket from the cylinder head whether you are changing plugs or just cleaning them. The face of each plug hole should be wiped clean to facilitate the proper installation of new and cleaned plugs.



TO PREVENT DAMAGE, remove plugs with deep socket wrench only.

Inspect the gasket. Its job is to maintain a gas-tight seal between the plug and its seat on the cylinder head. When the plug is removed, the areas of contact of the gasket with the plug should show up as a bright, clean, unbroken surface. If this is the case, the plug was installed properly, and the seal was tight.

If plug installation was faulty, discolored or corroded gasket surfaces will indicate leakage caused either by insufficient tightening, or by an uneven plug or engine seat. If the seat is clean, but the gasket appears to be entirely flattened out, the plug was tightened too much.

For best results, remove carbon, soot, and oxide coatings from the firing end of the plug with an approved cleaner and the special cleaning compounds available from manufacturers. To remove oily coatings from the top insulator and terminal, wipe the plug with a cloth moistened with a cleaning solvent. If the lower end of the plug has an oily or wet deposit, brush the plug in an approved non-toxic solvent. Dry the plug thoroughly with compressed air before placing in the cleaner.

When using the blast cleaner, rotate both the plug and the adapter that holds it. The cleaning blast should not be maintained for more than 3 to 5 sec at a time to prevent damage to the insulator tip or the electrodes. Blow out the cleaning compound with compressed air. It may be necessary to repeat this cycle several times to clean the plug properly.

After cleaning the plug, examine the threads for carbon deposits. If they are present, use a wire hand

continued on page 233

ALL-NEW MASTER TURN-A-TROWEL HAS POWER BLADE ADJUSTMENT

"This sure beats workin' ", said one operator after he'd tried the all-new Master "Powermatic" 34" trowel. "I've never had it so easy in my life . . . or done a better job."

No wonder he likes it. He pushes or pulls a knob and *engine power* tilts the combination blades to float or finish.

Know what that means? He gets exactly the job he wants, faster and easier.

He doesn't have to "fight" this trowel, either. The Master's only 14" from the slab to the *top* of the engine . . . has the *lowest center of gravity* of any power trowel. Wobble's a thing of the past. And the direct drive puts *all* the engine's power to work.

You'll like the all-new Master, too. The *automatic* clutch that let's the Briggs & Stratton engine get to operating speed before engaging the blades. The "dead man" control that *idles* the engine when you let go the handle. The stationary guard ring. They all make troweling easier and better.

The all-new Master in 34" gasoline-drive is now ready. Three or four blades, whichever you prefer. *Power blade-adjustment, direct drive, lowest center of gravity* and other new features make it your best buy. You'll like it. See it at your distributors or write us for full details.

MASTER **MASTER VIBRATOR COMPANY**
Stanley Avenue, Dayton 1, Ohio

Why Thermoid Hose Lasts Longer

Construction men everywhere find Thermoid Hose stays on the job longer—cuts replacement costs and down time. One big reason is quality construction. Another: Thermoid designs hose for specific conditions and uses. Here are three examples:

THERMINE — High pressure air hose. Oil resistant tube is reinforced by heavy duty yarn. Mandrel-built for precision construction and greater strength. Smooth, abrasion resistant cover.

#325 S.B. SUCTION — Heavy duty hose for water suction service. Smooth bore, wrapped hose with heavy wire reinforcement, durable duck plies.

#300 AIR HOSE — Wrapped construction, oil resistant synthetic tube and covers. Heavy duck reinforcing plies. Ideal for use in mines and quarries.

These are typical examples of how Thermoid Personalized Service meets the specific, exacting requirements of the construction industry.

Thermoid

Thermoid Company
Trenton, N. J.

Make Thermoid your choice, too for Multi-V Belts . . .

. . . and Conveyor Belting, specifically designed for the job.

Your Thermoid Distributor can help you select the Hose, Conveyor Belting, Multi-V Belts designed to lower your operating costs.

ONE BLAW-KNOX BATCHING SETUP

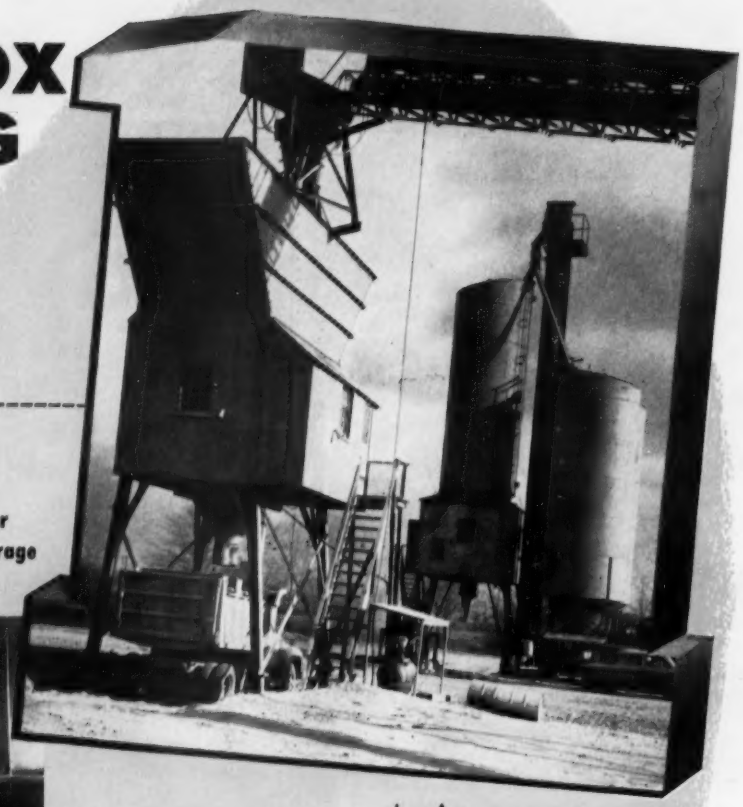
can keep three 34E Dual Drum Pavers working

1956 RECORD

Up to 240 Batches Per Hour

23,966 Batches without a major delay or shutdown for a 101.5-Batch Per Hour Average

◀ Blaw-Knox Automatic Batchers are arranged so the operator always has the dials, monitoring lights and truck within easy view. One switch puts these three automatic aggregate batchers in operation.



▲ Blaw-Knox two-stop setup with 150-ton, 3-compartment automatic aggregate batching plant and three 600 bbl. cement bins with automatic, twin batchers.

Take another look at the production records of the Blaw-Knox Batching Setup owned by J. A. Jones Construction Company on an Ohio paving job in 1956. That's the kind of production you would like—not only big volume of up to 240 batches per hour or a batch every 15 seconds but steady day after day production without delays. The contractor's superintendent says this performance assures him that the Blaw-Knox Batching Setup can keep three 34E Dual Drum Pavers working.

Steady, high capacity of Blaw-Knox Batching Equipment has been proved on concrete paving jobs in all parts of the country. Other features which contractors like about this equipment are the arrangement for switching from automatic to manual operation in the event of a power failure, double cement valves on cement batchers and the ease of servicing the automatic controls. If you are planning concrete paving work be sure to find out about these high production plants, today.

See Bulletin 2488 which shows the many sizes and combinations of Blaw-Knox Aggregate and Cement Bins and Batchers available to you. Your nearest Blaw-Knox Distributor will be glad to give you the whole story or write direct to—

BLAW-KNOX

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Construction Equipment Division

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REPLACE GASKET when installing new or cleaned spark plugs.

and free of any dirt or scale deposits that might interfere with proper seating.

Screw the plug by hand into the cylinder head. To tighten, use only a well-fitting deep socket wrench with not more than a 6-in. handle. Screw the plug down until it begins to squeeze the gasket. Then tighten it a quarter-turn further, and a proper seat between the plug and the cylinder will be obtained. If a torque wrench is available, it is a good idea to tighten the plugs according to the manufacturers' torque recommendations.

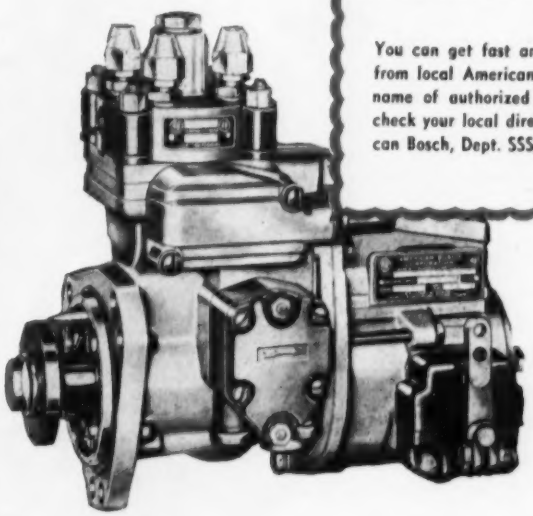
CLEAN ELECTRODE firing surface with distributor-point file.

MAINTENANCE SHOP...
continued

brush to clean them but be careful not to injure the electrodes or the insulator tip. Slight nicks or burrs in threads can be smoothed out with a fine three-cornered file. The cleaner may not remove all scale deposits from the undersides of the electrodes. Clean firing surfaces thoroughly with several strokes of a small, flat file.

When regapping plugs, adjust only the side (ground) electrode. Never bend the center electrode because sidewise pressure on this wire may crack or break the insulator tip and render the plug useless. Plugs should be regapped to the exact limits specified by the engine manufacturer.

When installing new plugs, or when replacing cleaned ones, always use a new engine seat gasket. Also be sure that the cylinder head threads and plug seats are clean



You can get fast and economical service from local American Bosch Agencies. For name of authorized agency nearest you, check your local directory or write American Bosch, Dept. SSS, Springfield, Mass.

the PSB fuel injection pump

UNEXCELLED

...for performance and outstanding service—that's the acknowledged record of more than 140,000 American Bosch PSB pumps now in use.

Here's some reasons why! Simple construction... fewer parts... accurate fuel metering and distribution ... positive governor control ... replaceable hydraulic head for fast field servicing.

What's more—all American Bosch fuel injection products are backed by a growing system of authorized service agencies, fully equipped to provide quick, efficient repair service.

Unequaled value—for top diesel engine performance and economy of operation... long trouble-free life... lower maintenance expense—nothing equals a PSB fuel injection pump.

AMERICAN BOSCH

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Division of
American Bosch Arma Corporation
Springfield 7, Mass., U. S. A.

4493-B

THE NEW BARCO VIBRA-TAMP*

For Vibratory Compaction of Granular Base Materials and Tamping Bituminous Surfacing

* Companion Tool to the Barco Rammer, Famous for Deep, Penetrating Soil Compaction.

APPROVED BY USERS!

BACKED BY BARCO DISTRIBUTORS EVERYWHERE!

EFFICIENT— one man does the work of many with VIBRA-TAMP. Operates in any weather. Works flush against curbs, foundations, and walls.

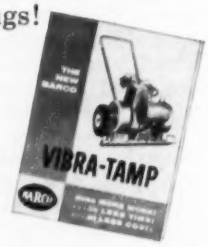
ECONOMICAL— to buy, operate, and maintain! Saves your bigger, costlier equipment. Tamps up to 750 sq. yds. per hour.

SAFE— moving parts fully enclosed. Simple controls.

DURABLE— simple design and quality construction keep VIBRA-TAMP on the job day in and day out.

The new Barco VIBRA-TAMP is a proven tool — superior in design and performance — backed by leading equipment distributors representing Barco in all parts of the country. Users report VIBRA-TAMP a big work-saver wherever low cost is a prime consideration. Take VIBRA-TAMP on the big jobs for hard-to-reach areas. Excellent for patching streets, driveways, and roads. VIBRA-TAMP has no economy equal — a real work-horse on sand, gravel, soil, chippings!

Ask for new catalog No. 630.



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BARCO MANUFACTURING CO.

BARCO RAMMER
for High Degree Soil Compaction

BARCO
PRODUCTS BACKED BY EXPERIENCE

512E North Hough St., Barrington, Ill.

BARCO VIBRA-TAMP
for Granular Fill and Bituminous Surfacing

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributors

Joy Mfg. Co.: The Rowen-Leahy Co., Inc., with headquarters in Hartford, Conn., will cover Connecticut and four counties in Massachusetts for Joy. The new distributor will handle Joy's air compressors, wagon drills, hand-held drills, paving breakers, spaders, tampers, and portable hoists.

Baker-Raulang Co.: New dealers in Chattanooga, Nashville, and Knoxville, Tenn., have been appointed by Baker-Raulang Co. The three will handle Baker's line of gas and electric fork lift, platform, and crane trucks, as well as the unique Traveloader side-loading fork truck. Ortmeier Machinery Co. is the new Chattanooga dealer; Peffen Machine Co. will cover Nashville; and Dempster Machinery Co. will cover Knoxville.

Four Wheel Drive Auto Co.: Road Equipment Co. of Dallas, Tex., is the new Four Wheel Drive truck dealer for Dallas county. J. M. Caudle is president of the new distributorship, which will handle sales, parts, and service for FWD's four and six-wheel-drive trucks.

Manitowoc Engineering Corp.: Chesapeake Supply and Equipment Co. is the new Manitowoc distributor in the Baltimore, Md., area. The new distributor has offices in Baltimore and Hyattsville, Md., and a branch office in Dover, Del. Chesapeake will handle Manitowoc shovels, cranes, trench hoes, draglines, and mobile cranes.

Cleveland Trencher Co.: Mississippi Road Supply Co., Jackson, Miss., is the new distributor for the complete line of Cleveland trenchers, sidecranes, backfillers and tampers for most of Mississippi. Another new Cleveland distributor is E. H. Kliebenstein Co. of Ridgefield, N.J., which covers 12 northern New Jersey counties.

continued on next page

* specially designed to cast huge

PRESTRESSED CONCRETE ROOF GIRDERS

for **American Cyanamid's** new phosphate storage warehouse

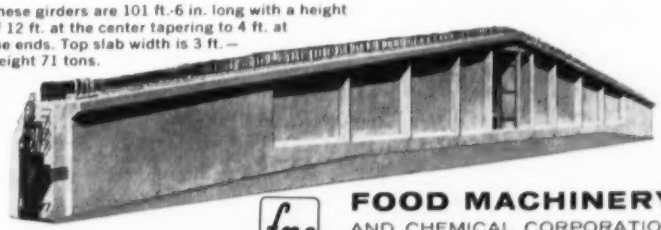
Working closely with Prestressed Concrete, Inc., Florida Division's Form-Crete engineering staff supplied special mass-production steel casting side forms to produce prestressed concrete griders for supporting the roof of American Cyanamid's new triple phosphate storage plant at Brewster, Florida.

This is a typical example of the capability of our Form-Crete consultant service in supplying custom designed and fabricated steel forms to meet your requirements for specialized projects.

Important as this service is, our main objective is the supplying of skillfully designed and engineered steel poured-in place and semi-portable side forms for flat bed casting. Fabricated to order, there is a Form-Crete form for virtually every standard prestressed concrete product.

Investigate this highly profitable new market – the prestressed concrete product field with its unlimited applications . . . write, wire or phone today – get into the prestressed concrete business now with FORM-CRETE steel casting forms!

These girders are 101 ft.-6 in. long with a height of 12 ft. at the center tapering to 4 ft. at the ends. Top slab width is 3 ft. – weight 71 tons.



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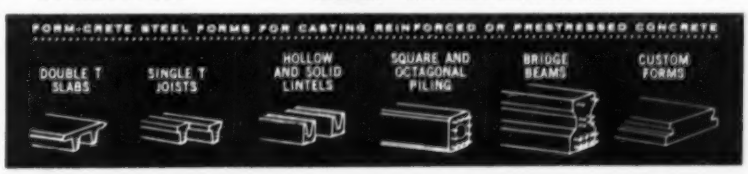
FOOD MACHINERY
AND CHEMICAL CORPORATION
FLORIDA DIVISION
LAKELAND, FLORIDA



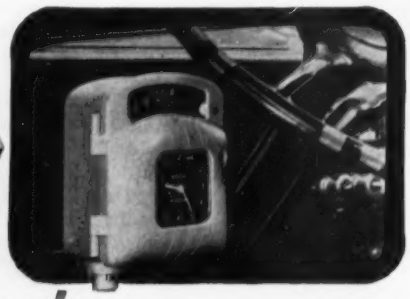
Sterling

CONCRETE BUGGIES GIVE YOU MAN-SIZE OUTPUT

• Sterling buggies enable you to speed up concrete delivery. They take a 6 cubic foot load directly from truck mixer or agitator, without danger of spilling. Roller bearings, pneumatic-tired wheels and dumping rockers make these buggies easy to wheel — easy to dump. Sterling perfectly balanced design reduces operator fatigue to a minimum. Write for catalog.

STERLING WHEELBARROW CO.
Milwaukee 14, Wisconsin, U.S.A.

IMPROVE THE EFFICIENCY OF YOUR MOBILE EQUIPMENT



Tachographs can lower repair costs, increase operation efficiency, and improve your safety record

Regardless of the type of vehicle you operate, a Tachograph will economically measure the complete performance of both equipment and drivers.

The Tachograph is an accurate recording speedometer that mounts easily on the dashboard. From the wax-coated chart that is inserted *inside* the tamper-proof aluminum case, you get a complete and permanent record of the entire operation. When started—Stopped—Idling time—Distance between stops. Easy-to-read illuminated dials also show time of day, m.p.h. and total mileage. Tachograph models which indicate and record engine r.p.m. are also available. There's the added safety advantage of the red warning light that signals the driver whenever your company's predetermined speed limit is exceeded.

Learn the full facts about Tachographs. The coupon below brings a copy of Bulletin SU-3—it tells the *whole* Tachograph story.

Wagner Electric Corporation 6462 Plymouth Ave., St. Louis 14, Mo.

Please send a copy of Bulletin SU-3.

Name and Position_____

Company_____

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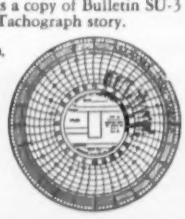
City_____ State_____

We operate_____ Vehicles

557-9



SALES AND SERVICE . . .
continued

Bucyrus-Erie Co.: IMC Equipment, Inc., of Atlanta, Ga., is the new Hydrocrane distributor for Georgia. The firm will handle the truck-mounted, all-hydraulic Hydrocranes, as well as the Hydrohoe, a hydraulically operated dragshovel.

Littleford Bros., Inc.: E. S. Brent, sales manager, recently announced the appointment of a new Littleford dealer, the Ray-Brooks Machinery Co. of Montgomery, Ala. Ray-Brooks will handle the Littleford road maintenance line, including the Heater-Planer, Trail-O-Dryer, Trail-O-Patcher, Trail-O-Roller, and other equipment.

On the Sales Front

Littleford Bros., Inc.: Edward Sterling Brent is the new sales manager for the Road Maintenance Equipment Div. of Littleford. Brent succeeds L. W. Glaser, who becomes sales director in charge of the southern states territory. Brent joined Littleford in 1933 as assistant purchasing agent.

C. I. T. Corp.: Two new representatives have been added to the financing firm's Texas force. Harold E. Tacker represents the company in western Texas and B. J. McNabb covers the eastern half of Dallas county and adjoining areas.

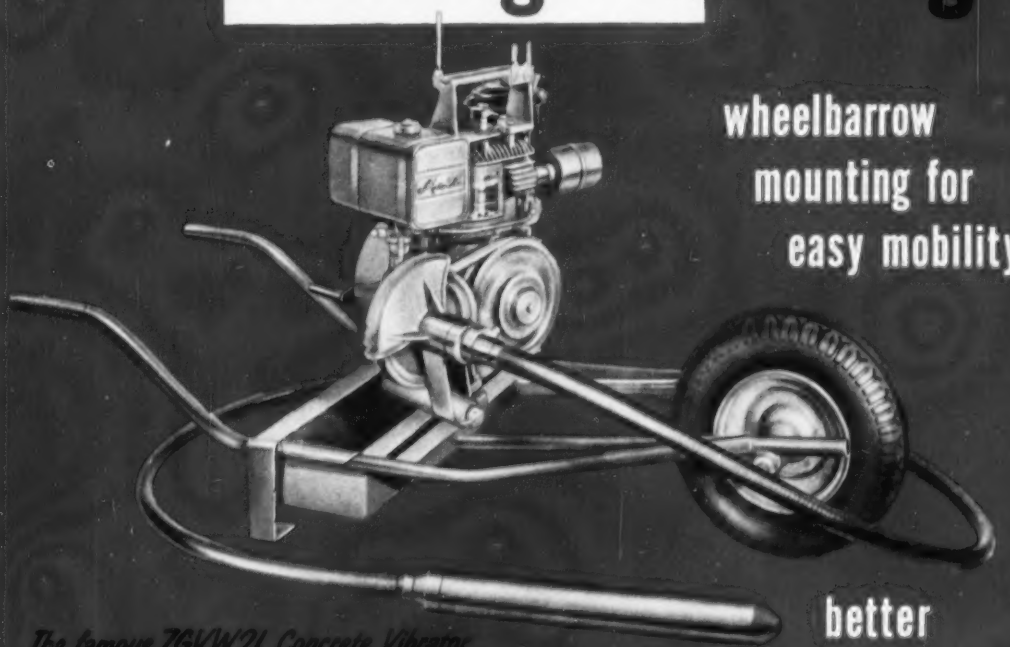
Ottawa Steel Div., L. A. Young Spring & Wire Corp.: Three new salesmen have been named by R. J. Racback, general sales manager. The men and their positions are: Carl W. Smith, Tracto-Lift sales engineer; Paul L. Ratliff, regional manager in Michigan, Illinois, Indiana, Ohio, and Kentucky, for the entire line of Ottawa products; and Robert H. Loose, regional manager in New York, Connecticut, Rhode Island, New Hampshire, Vermont, Maine, Quebec, and eastern Ontario.

T. L. Smith Co.: John R. Heinrich is Smith's new eastern district sales representative, according to an announcement by W. A. Clayton, vice president and director of sales. Heinrich will be responsible for the sale of Smith's line of truck, stationary, and portable mixers in the Atlantic seaboard states from Maine through South Carolina, including Pennsylvania, West Virginia, and parts of Canada.

continued on page 239

now, in concrete vibrators, too,

if it's Remington, it's right!



wheelbarrow mounting for easy mobility!

better concrete at lower cost!

The famous 7GVW21 Concrete Vibrator has 4 great features that make it right for you!

- Dependably powered by rugged single-cylinder, 4-cycle air-cooled gasoline engine with countershaft drive and automatic clutch.
- This versatile unit can also be used to power attachments for concrete surfacing, sanding, wire brushing, pumping and other jobs.
- Long-reaching flexible shaft made up of 7 ft. or 14 ft. sections. Extra sections can be added as needed.
- Unit can be moved right along with the work on pneumatic-tired wheelbarrow mounting. This unit is also available on 360° swivel round base mounting.

MODEL 7GVW21 *5 HP concrete vibrator. Available with 2⅛" x 20" 7,000 RPM vibrating head or 2⅛" x 12" 10,000 RPM vibrating head.*

Remington

MALL TOOL COMPANY
Division of Remington Arms Company, Inc.
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Mall®

Electric circular saws are best buys for every purpose

Electric impact wrenches speed up work on heavy equipment

Specifications subject to change without notice.

You'll use less cement, coarser aggregate and produce denser, more uniform concrete...and do it in fewer man-hours!

That's a mighty big order to be sure! But it's being done every day on every kind of concrete job by these indispensable vibrators by Remington—the newest name in power tools and famous for 141 years for quality in sporting firearms and ammunition.

You name it...Mall Tool Company, Division of Remington Arms Company, Inc., gives you a vibrator for every application from small form work to large mass concrete compaction. Over a dozen models, most available in gasoline engine, electric or pneumatic, including the new 1-man 115-volt vibrator with motor-in-head. Let us send you our latest catalog today!

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Please send free catalog on Construction Tools.

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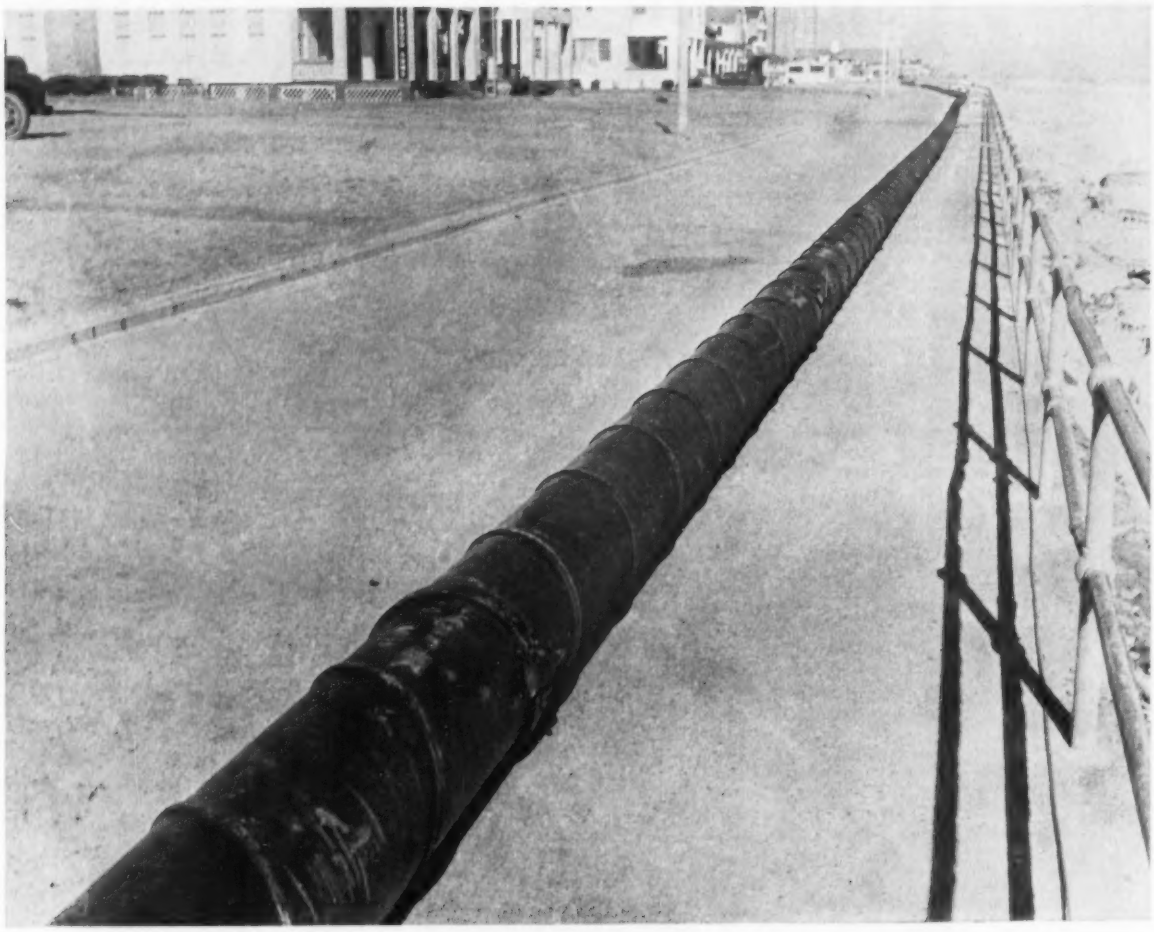
CITY _____ ZONE ____ STATE _____

USE THIS COMBINATION

To Speed the Job and Cut Costs



Take light-weight Naylor Spiralweld pipe for ease of handling and installation. Join it with the one-piece Naylor Wedgelock coupling for the fastest, simplest connection. The result:—you have a perfect combination in strong, safe, low-cost pipe lines for air, water, dredging, hydraulicking, ventilating and materials handling service.

Whatever your job, you can count on dependable performance from Naylor pipe in its full range of diameters from 4 to 30 inches.

For full details, write for Bulletins 507 and 513.

NAYLOR

NAYLOR PIPE COMPANY
1248 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office:
60 East 42nd St., New York 17, N. Y.

HOW TO HANDLE WET JOBS

#37 of a Series

ONE LIFT REMOVES 18 FT OF WATER FROM "PATCH-QUILT" SOIL

Sewage treatment plant, Clayton, N. J.
Contractor: C & T Affiliates, Inc.

SOIL on this job varied by area—fine silty sand here—coarse sand there—gravel a few feet away. This "patch-quilt" pattern precluded routine handling.

GRIFFIN engineers carefully planned proper installation for each wellpoint, using sand filters on some but not others.

This plus other special methods lowered the 18 ft of water with a money-saving single-stage wellpoint system. Top photo shows system placed directly at water level.

GRIFFIN

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

SALES AND SERVICE . . .
continued

Clark Equipment Co.: Edouard G. Petit is the new district representative in eastern Canada for the Construction Machinery Div. He will represent the division, which recently broadened its Michigan line with heavier scrapers and tractors, in the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island. Petit was formerly with the Frank G. Hough Co.

In the Main Office

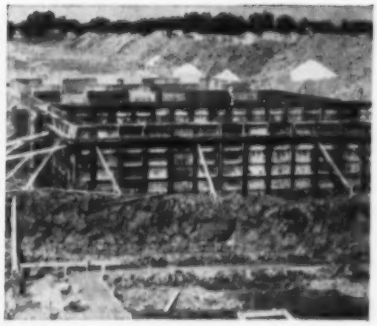
Massey-Harris-Ferguson, Inc.: The appointment of Albert A. Thornbrough as president has been announced by the board of directors. The board also announced the appointment of J. H. Shiner and H. A. Wallace as vice presidents. Thornbrough, a graduate of Kansas State College and Harvard University, was formerly a vice president and director of Harry Ferguson, Inc. of Detroit. He recently was appointed president of Massey-Harris-Ferguson, Limited.

T. L. Smith Co.: R. W. Smith, president, announces the appointment of W. A. Clayton as vice-president and director of sales. In his new job, Clayton will be responsible for over-all company sales policy and he will continue to handle his previous duties as general sales manager.

Wisconsin Motor Corp.: H. A. Todd, president, confirmed the action of the board of directors by appointing two new vice presidents. The two are F. Burrows Esty, chief engineer, and Ray J. Fellows, sales manager.

Timken-Detroit Axle Div., Rockwell Spring and Axle Co.: N. R. Brownyer has been named vice president, director of engineering, of the axle div., according to an announcement by Fred W. Parker, executive vice president. Brownyer will be responsible for the coordination of all division engineering activities.

Vickers Inc.: J. F. Forster is the new executive vice president of Vickers, world's largest producer of oil hydraulic equipment. A graduate of the U.S. Naval Academy, Forster joined Vickers as treasurer in 1941. He became a vice president in 1949.



WACO Forms Foundations for 1¢ per Square Foot

Mr. Louis Castiglia of the Columbia Concrete Company of Norridge, Ill. Mr. Castiglia says: "Our cost per foundation for forms amounted to 1¢ per square foot. We purchased two sets of 8′ foundation forms for a 400-home project, and, at the present time, each set of forms has given us over 150 pours!" Mr. Castiglia feels that Waco forms are adaptable to any type of foundation wall regardless of size.

The Columbia Concrete Company purchased 2,000 square feet of forms on their original order. Since that time, the company has increased its total square footage to approximately 35,000 square feet. Columbia Concrete Company uses Waco forms on both residential and commercial projects.

Many other contractors, like the Columbia Concrete Company, report that using Waco Concrete Forms has allowed them to compete most favorably with other types of basement construction. These contractors not only save labor-costs during construction . . . they also find that Waco Forms, with their quick-alignment grooves, give seams that require no sanding.

Investigate these Waco Forms before you rent or buy. With the wide choice of forms available from Waco, you're sure to get the right form to do every job *right*.

WACO MANUFACTURING CO.
3565 Wooddale Ave., Minneapolis 16, Minn.

Please send me more information about:
☐ New Waco Forms.
☐ Choice Distributorships Available.

Name_____
Firm_____
City_____ State_____

Why use automobile grease in heavy-duty equipment?

Let's not kid ourselves about the difference between the lubrication requirements of automobiles and heavy-duty machinery. D-A Lubricants are compounded specifically for heavy-duty equipment. There is a right one for every application.

For example, D-A Track Roller Lubricant • D-A Type AC Track Roller Lubricant • D-A Winter Track Roller Lubricant • D-A Open Gear • D-A Torque Fluid • D-A Lithium, Extra-Heavy.

Let your D-A Representative give you all the facts on how D-A Lubricants can reduce parts wear and minimize downtime . . . *increase the return on your equipment investment.*

D-A Lubricants make equipment last longer

105 Tractor—Excavator powered by 143 HP GMC Diesel engine can lift and load single pieces up to 12 tons.

THE EIMCO 105 EXCAVATOR LOADS MORE - FASTER . . CHEAPER

Eimco 105 Tractor-Excavators operate on a 10 to 12 second loading cycle. This speed can be maintained under ideal conditions.

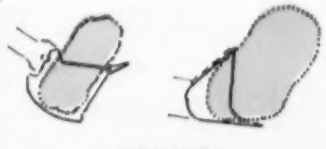
Greater Capacity at 1/3 Initial Cost -

In tough conditions the 105 will out-perform other excavating equipment on a more impressive scale. It will pick up and discharge into the haulage unit much larger pieces of material than will go thru the bottom of a bucket on a boom shovel of equal (1½yd.) capacity.

The 105 will exert greater digging force at the bucket lip than the larger, more expensive boom equipment - often eliminating blasting.

Equipment used around boom shovels such as bulldozers (for pushing up the broken rock) are eliminated with the Eimco 105 because this maneuverable tractor mounted excavator does its own bulldozing.

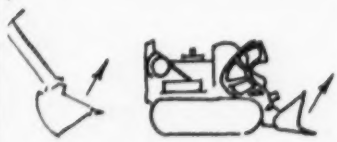
Eimco 105's are rugged, heavy duty machines, built to stay working on the job. Proven overall operating and maintenance costs are 40% less than boom shovels of same bucket capacity. Independent final drives provide greater maneuverability. Up-front position for the operator gives him full visibility. There are many other advantages in the 105. Write for complete information.



COMPARE

BOOM SHOVEL—EIMCO

11/2 yard boom bucket loading is limited to size that will go thru bucket. Eimco 11/2 yard bucket load is limited only to weight machine can lift.



COMPARE

BOOM SHOVEL—EIMCO

Digging effort on 11/2 yard boom shovel (45° boom angle bucket on ground) 24,000#. Digging effort on 11/2 yard Eimco shovel 39,200#.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

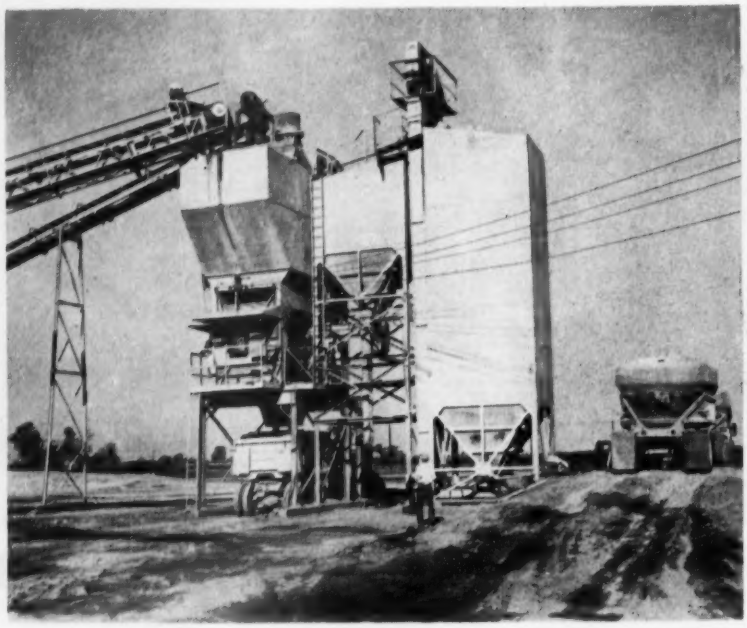
New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

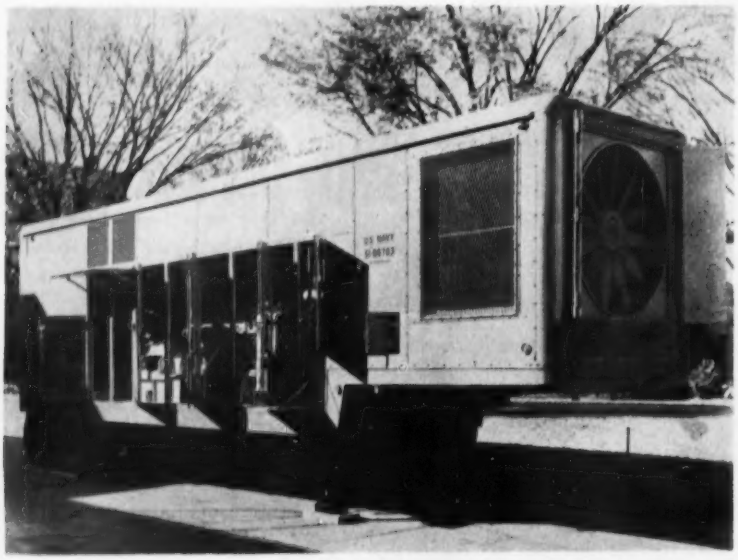
B-243

Construction Equipment News . . .

300-YPH Plant Weighs Three Materials at Once

Because it weighs three materials —sand, aggregate, and cement— for a single batch at the same time, Noble's new concrete batching plant can turn out up to 300 yph, according to company officials. The plant's factory-assembled sections, all within legal width limits for highway transport, are easily moved to the batching site and quickly erected on timber or concrete. Batching components are housed within the bin center section and do not need to be removed for transport. Electrical connections are simple twist-lock couplings. A recording device records on a single chart the batch designation, weights of cement, aggregate, and sand.—**Noble Co., 1860 7th St., Oakland 20, Calif.**





Compact Trailer Holds Generating Plant

Called the world's most powerful trailer-mounted diesel generating plant by the manufacturer, Fairbanks, Morse & Co., this new mobile power station is rated at 675 kw for continuous, heavy-duty service. Completely self-contained, the plant meets size and weight requirements for highway travel. The unit weighs 72,000 lb, or about 107 lb per kw. A major factor is the use of the Fairbanks-Morse opposed-piston diesel engine, a compact and light power plant rated at 962 hp at 720 rpm. The trailer also houses a generator; switch gear and control equipment; cooling, lubricating, and fuel systems; starting compressor; auxiliary engine, and 450-gal fuel tank. The manufacturer also produces three stations rated at 350, 400 and 500 kw.—**Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.**

Easily Handled Trowel

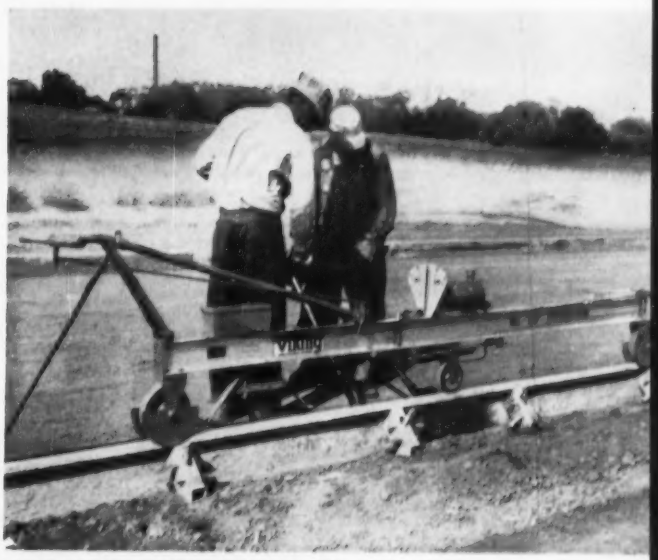
Operator climbing ladder with one of the two new Kelley trowels illustrates portability of the units. The new machines are the 24-in. Bantam, which weighs 75 lb, and the 29-in. Boy, which weighs 90 lb. Both have four blades whose pitch can be changed easily during operation by the click-stop adjusting lever.—**Kelley Machine Div., Wiesner-Rapp Co., Inc., 285 Hinman Ave., Buffalo 23, N.Y.**

Rugged Fork Lift Truck Handles Rough Terrain

Clark's new 20,000-lb capacity fork lift truck, featuring four-wheel drive and finger-tip direction controls, works easily in mud or over rough terrain. The power train consists of a four-speed power-shift transmission and a torque converter coupled with a 143-hp General Motors diesel. Called the Ranger-200, the truck has 14 in. of underclearance and all wheels have 14.00x24 tires. The wheelbase is 108 in. and the turning radius is 312 in. The truck, which weighs 32,470 lb empty, will travel at a top speed of 25 mph in both forward and reverse. A single lever controls both the fork lift and tilt movements—**Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.**

Builds Curbs Without Forms

Miller's automatic asphalt curb extruder places curb at the pavement edge or within 1 in. of obstructions without the need for forms or hand finishing. One man rides and steers the machine, called the Curbilder, while two loaders supply asphalt. Two models are available, one with two compacting chambers and the other with one chamber. Five standard curb form designs are available and special forms can be ordered. The Curbilder is powered by a Wisconsin air cooled engine, and the exhaust is directed in front of the machine to clean and heat the surface.—**Miller Spreader Corp., 4020 Simon Rd., Youngstown, Ohio.**



A Rolling Straight Edge

The Hi-Lo Detector is virtually a rolling straight edge. It travels over forms or pavement surfaces and dye marks high or low spots that fail to meet specifications. The machine consists of a 10 ft long aluminum beam that rolls easily on rubber-tired wheels. A center wheel measures up and down variations and registers them on a large scale graduated in ⅛-in. readings. When the wheel guides are lowered, above, the Hi-Lo Detector can be used on forms, permitting form crews to spot irregularities faster and more accurately.—**Viking Mfg. Co., Manhattan, Kansas.**

continued on next page

Removing track master pin on the job with OTC hydraulic ram and adaptors.

One man in *minutes* can remove or install a track master pin with the OTC Power Twin hydraulic puller and attachments. Works equally well on all makes anywhere—shop or field without damage to parts or tools.

Hand or electric pumps power 50 or 100 ton rams, the heart of the OTC hydraulic pulling system. By adding inexpensive adaptors, units can pull or install tractor sprockets, gears, sheaves, bearings or pulleys on all types and sizes of equipment—pay for themselves in time saved on just one job.

OTC

Write for free ***NEW*** *Contractors Tractor Manual.* OTC Manual

OWATONNA TOOL COMPANY

380 Cedar Street Owatonna, Minn.

EQUIPMENT NEWS... continued

SECOND OFF-ROAD HAULER—A rugged 25-ton model is the second Autocar entry in the off-highway truck field. The first unit, a 15-ton model, was introduced several months ago. A third and larger model is planned for later this spring. The new member of the line, the AP-25, is available with either a 335-hp or a 375-hp Cummins turbo-charged engine. The truck features a planetary-gear drive rear axle with the planetary reduction taking place at each outer end of the rear axle. This design reduces torque loads on the differential and axle shafts. Other features include a fully adjustable steering wheel, an all-welded box section frame reinforced with corrugated plate, an offset-mounted cab with many driver conveniences, and an Allison torque converter (optional). The steering wheel can be adjusted forward or backward over an arc of 15 deg, and it can be raised or lowered a full 2 in. The box frame of the new truck is made of ⅝-in. steel reinforced internally with corrugated plates of the same thickness. Reinforcement is plug-welded to alternate sides of the box section at 30-in. intervals. The frame has an average depth of 15 in. Standard tires on the front of the new truck are 14.00x25, 20-ply, rock rib thread. Dual rear tires are 18.00x25, 28-ply, rock lug tread.—**Autocar Div., White Motor Co., Exton, Pa.**

VERSATILE LADDER TRENCHER—Challenge Mfg. Co.'s new ladder type trencher digs square or round bottom trenches from 12 to 18-in. wide and up to 5¼-ft deep. Nine travel speeds and 18 trenching speeds give the small rig a wide range of operating flexibility. The trencher can dig in a straight line or at any radius. A hydraulically operated 5 ft 8 in. backfill blade is standard equipment. It permits the operator to clear a path ahead of the trencher, to level off high spots, and to refill

Cement Mixer Takes 60° Grade, one of many Four Wheel Drive tests. In all these grueling tests, Cities Service Lubricants make the grade and then some! They've done it for 20 years.

Early Four Wheel Drive Truck is one of vehicles in firm's museum. Founded in 1910, the company's first production amounted to 12 vehicles. Today, it is thousands yearly.

Toughest trucks made— Toughest lubricants used!

Four Wheel Drive Auto Company has been Cities Service customer for 20 years!

If you think things are tough on the trucks at your construction job or quarry, you should visit the Four Wheel Drive plant at Clintonville, Wisconsin.

There you'd see famous Four Wheel Drive trucks going through tests tougher than they'll probably ever meet on your job or anyone else's.

Ditto for the Cities Service Lubricants that Four Wheel Drive uses.

For what could be tougher on a truck and its lubricants than grinding up a hill in loose sand . . . sinking axle deep in a mud bath . . . driving diagonally across a washboard test ground . . . and climbing a 60 degree grade of dirt or gravel?

Make no mistake, Cities Service Lubricants meet the test . . . and have for the past 20 years at Four Wheel Drive Auto Company.

So it stands to reason that however tough the terrain and conditions on *your* job, Cities Service C Series Motor Oils and Trojan H Multi-Purpose Grease will more than make the grade . . . especially if you follow the expert recommendations of your Cities Service Lubrication Engineer.

For all the details, call the nearest Cities Service office, or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

NEW WHITE
FOR CONSTRUCTION SERVICE

Newest White tandem-axle chassis for cement mixer or dump truck chassis is this White 9064. Front power take-off for efficient, economical mixer service. Real strength and durability with double channel, heat-treated steel frame . . . bolted construction.

RUGGED and STRONGER to do

NEW WHITE FOR CONTRACTORS' DUMP SERVICE

This White 9000 does a great job of cutting costs in dump truck service. Here it has 8 cu. yd. contractor dump body engineered for production-line service. Rugged units throughout keep it on the job regardless of how tough the operating conditions.

NEW WHITE FOR HEAVY TRANSPORT

New White 9000 tractor handles big-payload trailers with real skill. Excellent maneuverability. Gasoline or diesel powered. Engineered to your exact operating requirements.

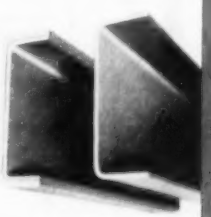
Call on White—at Truck Headquarters—around the world!

more work . . . last longer!

Ready for *more* work on construction projects around the world, these new White Trucks are engineered for big loads and busy schedules. Husky straight trucks, tandem-axle units and tractors are all built to construction industry specifications.

Why not find out for yourself how White can haul bigger payloads . . . at lower cost . . . for more years. See your White Representative.

THESE WHITE FRAMES ARE DURABLE AND TOUGH!



Look underneath! One look at the White double channel, heat treated alloy steel frame tells a great story of durability and strength. Bolted construction for more work time—less down time.

THE WHITE MOTOR COMPANY
CLEVELAND 1, OHIO

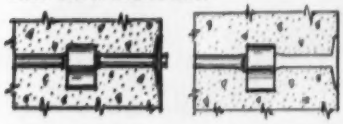
White
THE TRUCK THAT KNOWS YOUR BUSINESS!

How to Build Better Walls

It's easy . . . use Sure-Grip concrete accessories.

When you use Sure-Grip Snap-In form ties, your walls line up better, don't leak at tie points and are easier to point. They look better too, because there aren't any big, loose cone patches staring you in the eye.

Sure-Grip's **patented** Snap-In tie which has special flat pieces or clevises fastened to the rod does the job. These clevises keep the tie from turning and breaking the bond with the concrete. Result . . . no leaking, positive snapping and a lot of time saved. Try Sure-Grip Snap-In form ties on your next job and see how much better they are than other ties or twisted wire.

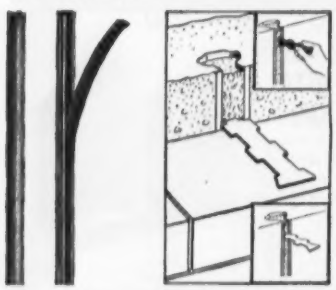


Flat clevises keep tie from turning and breaking bond with concrete. Tie always breaks at proper point.

Special coating on rod between clevises and spreaders prevents bonding to concrete. ⅓ turn snaps off rod.

Sure-Grip Anchors & Anchor Slot

. . . the surest and fastest way to fasten brick, stone, tile or terra cotta to concrete walls, columns and beams. Just nail the anchor slot to the forms. The **patented** double nailing feature supports the sides of the slot and keeps them from caving in when pouring. You don't have to grind anchors to make them fit. Sure-Grip anchor slot is made from rust resisting material; galvanized steel, Zinaloy, copper, etc., and is available in lengths from 6" to 10' either with or without the slot filler.



We also make a full line of stone, brick and furring anchors for every application.

FREE — Mail the coupon below for our 48 page catalog of concrete accessories and your nearest Sure-Grip dealer's name.

THE DAYTON SURE-GRIP & SHORE CO.
505 Kercher Street Miamisburg, Ohio

Without obligation, send me your **free** 48 page catalog and the name of my nearest Sure-Grip dealer.

Name_____

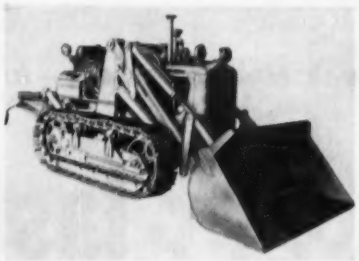
Firm_____

Street_____

City_____ State_____

EQUIPMENT NEWS . . . continued

trenches. Another feature of the trencher is a depth indicator that enables the operator to determine his exact digging depth without stopping the digging operation. All controls are hydraulic and within easy reach of the operator's position. A vari-speed, hydraulically controlled reversible conveyor provides plenty of working room along side the finished trench.—**Challenge Mfg. Co., Los Angeles, Cal.**



INTEGRATED LOADER—An integrated tractor-loader unit, the Oliver OC-126 features good operator visibility, a low center of gravity, and a rugged loader frame. To give the operator 360-deg clear vision, the side pedestals of the loader are 20% lower than previous Oliver buckets. Capacity of the bucket is 1½-yd. The tractor that carries the bucket is powered by a 53-hp diesel or gasoline engine. It incorporates Oliver's Power-Turn feature, which give the loader two-track power at all times, even when turning.—**Oliver Corp., 400 W. Madison St., Chicago 6, Ill.**

100-TON JACK — Western Railroad Supply Co. has added a 100-ton, two-stage hydraulic jack to the line it purchased recently from the Buda Div., Allis Chalmers Mfg. Co. Simple in design and ruggedly constructed, the 100B-12 is rated at 100 tons at a lifting height of 6⅛-in. The jack is equipped with a tandem pump. By actuating both high-speed and high-lift plungers, the operator quickly brings the

continued on page 251

Quick Action...and Tight, Pressure-Proof Connections

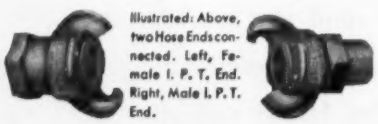
"AIR KING"

Quick-Acting, Universal

HOSE COUPLING

FOR COMPRESSORS, ALL TYPES OF AIR TOOLS, WATER, OIL AND SPRAY SERVICE

This versatile coupling is built along plain, rugged lines to assure long, trouble-free service under severest working conditions.



Illustrated: Above, two Hose Ends connected. Left, Female I. P. T. End. Right, Male I. P. T. End.

The "Air King" will reduce operating costs wherever quick connections are required. Locking heads are identical for all sizes of hose or threaded ends within the coupling's size range, and are locked by pressing together and applying a quarter-turn. Equipped with patented Safety Locking Device. Bronze or rustproofed malleable iron, in sizes up to 1".

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
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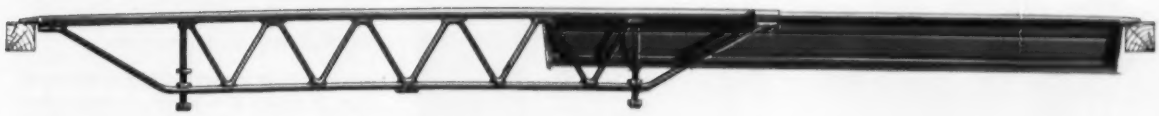
DIXON VALVE & COUPLING CO., LTD., TORONTO Associate Companies

THIS IS Spanall®

HORIZONTAL SHORING



NEWEST EQUIPMENT FOR BEAM AND SLAB CONCRETE FLOOR FORMS— SAVES UP TO **40%**

Use SPANALL once, and you'll never again build forests of costly vertical steel or timber shoring. Because SPANALL makes this type of formwork construction safe, easier and faster. Contractors report *direct* savings up to 40% in time as well as money, plus additional *indirect* savings that accrue from access to floors below the forms—floors with wide open spaces invitingly free and clear for storage or for getting a head start on other work. Newly published Catalog details all the cost-saving advantages; ask your distributor for your copy. Or write us direct.

Engineered for generous load-bearing capacities based on safety factor of 2.17, SPANALL applies to all types of construction: flat slab—beam and slab—structural steel—metal pan—drop head—filler block, etc.

SPANALL OF THE AMERICAS, INC.

787 United Nations Plaza • New York 17, N. Y.

For detailed information, write Dept. M

Simple adjustment sets correct camber as sections assemble to wide range of span lengths without need for intermediate vertical shoring

(Advertisement)

New Super-Float Blades get on concrete earlier, eliminate overtime finishing costs!

These new Superior clip-on SUPER-FLOAT Blades *are saving contractors hours of labor and overtime costs and are preventing loss of slabs due to insufficient finishing time!* SUPER-FLOATS have 25% more area than standard SUPERIOR blades and are available as accessories for all existing SUPERIOR Senior and Junior Concrete Finishing Machines. *Their increased area supports far more weight on wet concrete, thus permitting use of machines earlier!* With SUPER-FLOAT's extensive blade area the concrete is also worked faster...floated quicker to a smooth, level surface. This earlier flotation brings moisture up where sun, wind and air can reach it, evaporating more speedily and causing a faster set, *thus gaining additional hours for finishing without necessity for overtime costs!* It also eliminates idle time between floating and finishing.

ONE SUPERIOR MACHINE FLOATS AND FINISHES – Due to its patented construction, blade tilt on all SUPERIOR models can be changed almost instantly from flat to a high angle...double that of most other machines. This high tilt *puts maximum weight on the blade edges* for a powerful, continuous trowelling stroke. Resulting surfaces are flat-trowelled and can be polished with little extra effort.

MANY CONSTRUCTION FEATURES – Suspension of blades is unique...equalizing wear over blade surfaces and extending overall blade life. All SUPERIOR machines are equipped with a life-time lubricated and sealed reduction gear unit that virtually frees you of maintenance. SUPERIOR also pioneered the stationary guard ring which works up to and against obstructions without affecting control of machine.

SATISFIED USER REPORTS – *"The SUPERIOR does 5 times the work of any other machine. We can work concrete black without stalling. After trying several other makes, we now own 8 SUPERIORS and won't use anything else."*

WRITE FOR BULLETINS! Get data on all three SUPERIOR Concrete Finishing Machine sizes. See why *"No slab has ever been lost with a SUPERIOR, no slab has ever required grinding!"* A letter or postal card will bring your copies!

SUPERIOR Concrete Finishing Machines fulfill all job requirements from large to small, are furnished in 3 sizes: Senior, 6.5 h.p. Junior, 2.5 h.p. Midget, 1½ h.p.

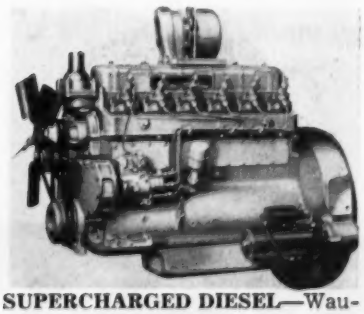
Note increased area of SUPER-FLOAT blades and simple method of attachment.

SUPERIOR CEMENT TOOL CORPORATION
11616 Wright Road • Lynwood, California

The SUPERIOR Senior floats large areas quickly, does all jobs faster with new SUPER-FLOAT Blades. Note how stationary guard ring protects rotating blades from obstructions without affecting control of machine.

ram into contact with the load. Using the lift plunger alone raises the load. Dual release valves in the base can be operated from either side. The jack base is drilled and tapped for a pressure gage, which is available as optional equipment. **—Western Railroad Supply Co., 2400-2434 S. Ashland Ave., Chicago 8, Ill.**

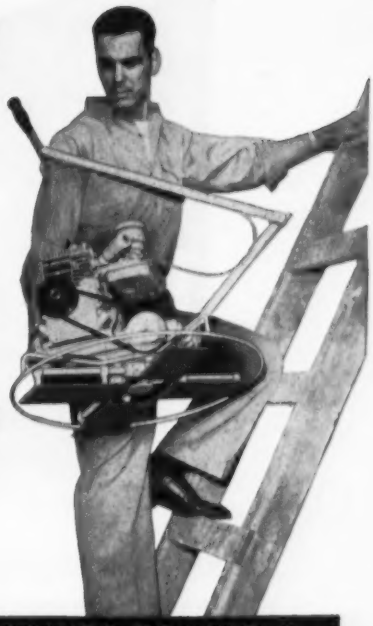
RUGGED HOSE—A new hose for pneumatic drills has been developed by Hewitt-Robins, Inc., for heavy-duty use on jobs that require a hose that is tough but lightweight and easy to handle. The hose will be marketed under the name of Duroil air drill hose. It contains a Buna N tube resistant to oil and vapors, a braided rayon cord carcass that will not contract or elongate under working pressures, and a natural rubber cover with a tensile strength in excess of 2,000 psi. The hose will be available in 500-ft. reels, in diameters of ½, ¾, and 1-in.**—Hewitt-Robins, Inc., Stamford, Conn.**



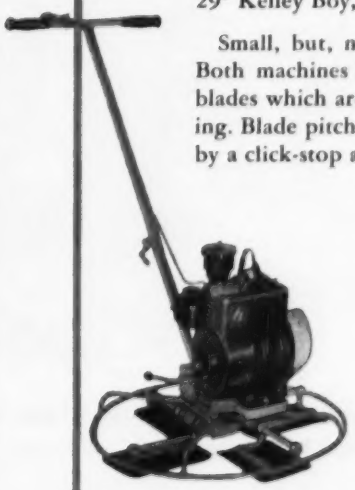
SUPERCHARGED DIESEL—Waukesha's latest engine is a compact, supercharged diesel with a maximum 131-hp rating at 2800 rpm and a displacement of 302 cu in. Called the 197-DLCS, the engine incorporates Waukesha's patented combustion chamber, which will burn any standard diesel fuel with

Look!

ONE HAND!



REALLY PORTABLE POWER TROWELS



Now you can float, level, or finish with either the 24″ Kelley Bantam, weighing only 75 lbs., or the 29″ Kelley Boy, 90 lbs.

Small, but, man, can they turn out the work! Both machines have four wide-sweep combination blades which are used for both floating and finishing. Blade pitch is easily changed during operation by a click-stop adjusting lever.

Perfect balance and low center of gravity assure easy operation . . . no pulling, tugging, or gyrating to tire you. Design is simple; nothing to go wrong . . . equipped with Timken bearings . . . one-point lubrication . . . easy to clean . . . simplified maintenance.

Larger sizes also available — Kelley Hydra-Trowels 34″ and 44″ sizes.

Kelley MACHINE DIVISION
283 Hinman Ave., Buffalo 23, N. Y.

☐ Please tell me more about the Kelley Bantam and the Kelley Boy.

☐ Also send me information on larger sized Kelley machines.

Name _____

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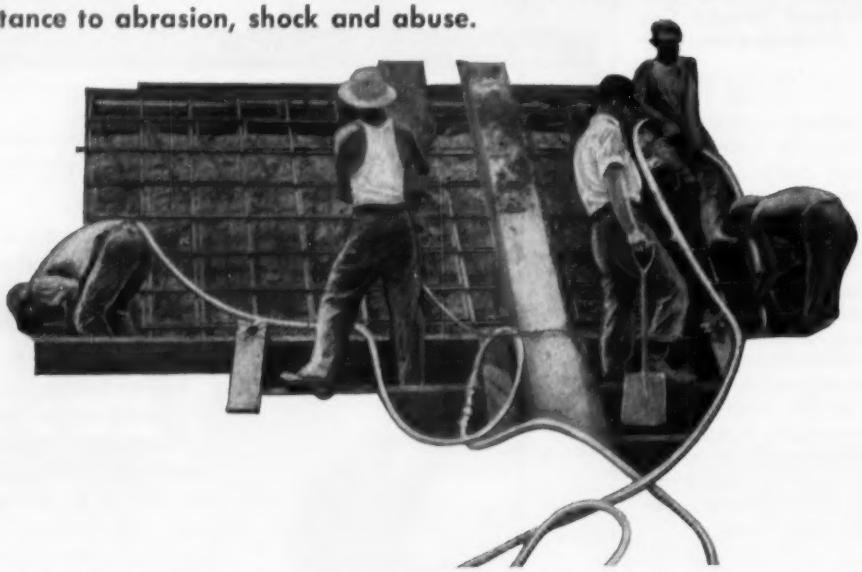
FOR HANDLING AGGREGATE . . . Hamilton Conveyor Belting gives exceptional resistance to abrasion, shock and abuse.



VIBRATING CONCRETE . . . Revelation Air Hose gives longer service life because of extreme flexibility and toughness.

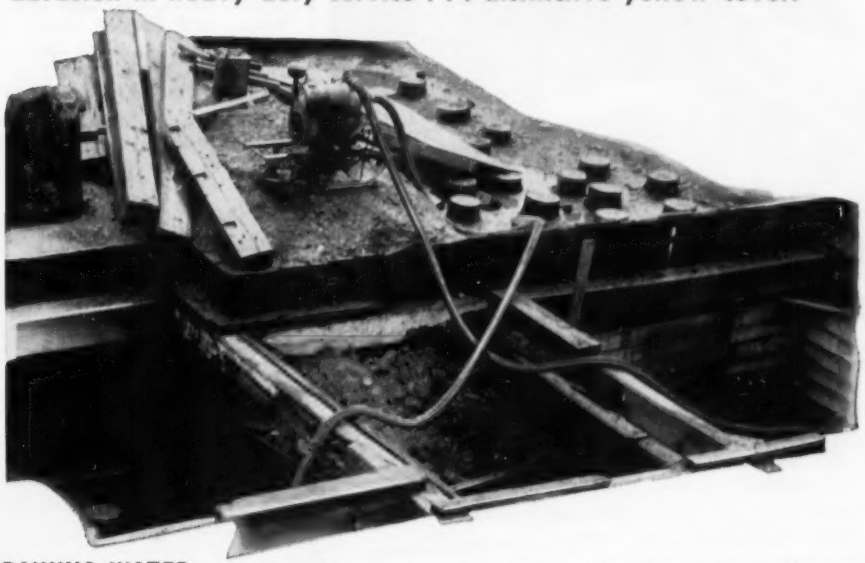
OVER 87 YEARS OF SERVICE TO INDUSTRY

Write today for more information and literature.

HAMILTON

ATLANTA • CHICAGO • CLEVELAND • HOUSTON • PITTSBURGH

DRILLING ROCK . . . Gold Bond Wirebraid Air Hose defies abuse, weather and abrasion in heavy duty service . . . distinctive yellow cover.



OR DRAINING WATER . . . Revelation Cord Suction Hose recovers shape after crushing . . . resists wear, weather and hard use.

RUBBER MANUFACTURING CORP.
TRENTON 3, N. J.

A Division of Acme-Hamilton Manufacturing Corporation

INDIANAPOLIS • LOS ANGELES • NEW YORK • SAN FRANCISCO

Drives six-inch spike into solid concrete —with *Ramset*®

On roofs, on sidewalls, on foundations, workers sink stout fasteners into hard concrete as easily as pulling a trigger . . . and just as fast!

Does a day's work in an hour! On new construction, maintenance, electrical, plumbing or other tough fastenings — do it the easy way, with RAMSET powder-actuated fastening.

Need fasteners in a hurry? There's a RAMSET dealer near you ready to bring them. Call him now (see phone book yellow pages under Tools.)

Get the money-saving facts for your specific job from your RAMSET dealer or write for new catalog now ready.

companion tool

Shure-Set®

a hammer-in tool that uses no cartridge, but makes your hammer power more effective. For masonry, mortar joints, cinder blocks. Ask for catalog.

Ramset Fastening System

WINCHESTER WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION

12103-D BEREA ROAD • CLEVELAND 11, OHIO

a cetane rating of 45 or above. The exhaust turbocharger system of supercharging on the new engine reduces the parasite load and increases horsepower in relation to size. The six-cylinder, four-cycle diesel has the exhaust turbocharger mounted directly on manifolds. Other features include Stellite-faced valves that seat on Stellite-faced inserts; iron crankcase-cylinder casting with dry sleeve, renewable alloy liners; drop-forged, rifle-drilled, steel connecting rods; heavy seven-bearing, drop-forged crankshaft with hardened journals; and aluminum pistons with chrome top rings. The lubrication system is handled under full pressure from a gear-driven, gear-type pump to the main rod, camshaft, and piston pin bearings. Metered intermittent pressure is provided for timing gears and rocker arm, and pistons are oil-cooled through connecting rod jets. The fuel system incorporates a Roosa single plunger, flange-mounted injection pump. **—Waukesha Motor Co., Waukesha, Wis.**

IH POWER UNIT—A new model diesel power unit, the UD-281, has been introduced by International Harvester's construction equipment div. The four-cylinder engine has a 60-hp rating at 1800 rpm. This is 5 hp more than the engine it replaces in the IH line, the UD-264. The smallest in the IH diesel line, the engine has a piston displacement of 281 cu in. Bore and stroke are 4⅛x5¼-in. **— International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

NEW IH SCRAPERS—A new adjustable cutting edge is among the features (above) of two new International Harvester tractor-drawn scrapers—the 20-yd 4S-85 and the 14-yd 4S-55. The 4S-85, which carries 16 yd struck, is matched to the International 200-hp TD-24 crawler tractor; the 4S-55, which handles 10 yd struck, will team with the 105-hp TD-18 crawler. The new type cutting edge on the scraper blades consists of three interchangeable, reversible

Big job, this all-concrete, 4-tier Ann Arbor, Michigan, parking structure. Size is 233' x 165'; capacity, 479 cars.

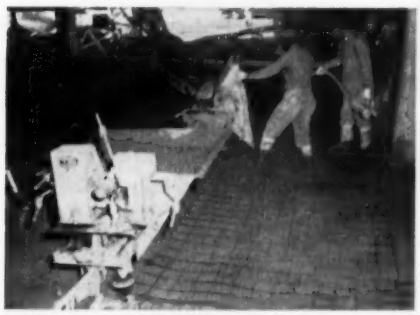
REX RAILPORTER

"Best way to do this big 4-story job...and save most"

—says busy contractor

This is Railporter. Capacity is 1400 lb., 14.6 cu. ft. Non-powered trailer unit doubles capacity.

Railporter loads at hopper. Touch of control sends it swiftly on its way to pour site—alone!



Quick dumping (either side), then Railporter scoots back fast for another load. Note rail pattern. Goes where you want it.

Do new ideas pay off? Here's one that does—and big. It's Rex Railporter.

Contractor Jeffress Dyer, Inc., saw its advantages in the building of a new 4-tier parking station for the University of Michigan—then went on to profit these many ways:

- Railporter poured an average of 150 yards daily
- Top pour was 160 yards in 6 hours
- Released 12 men for other important work on the job
- Cut completion time, saving a considerable amount of money
- Poured a total of 5000 cubic yards on the 4 stories and ramps

These are the time and money saving advantages you get with Railporter. Here's why. It's the really modern way of moving concrete and construction materials. It's tops for speed and simplicity. Imagine a versatile self-propelled unit that runs on a single rail—entirely unattended. It travels straight lines, curves, restricted headroom areas—stops automatically, dumps fast. One control for forward or reverse.

It's simple, fast to set up. Handy monorail sections connect in a jiffy. Perfect alignment isn't necessary.

It will cost you nothing to talk Railporter with your Rex Distributor—but it can save you important money. CHAIN Belt Company, 4664 W. Greenfield Ave., Milwaukee 1, Wisconsin.

The picture story complete. Get this informative, well-illustrated Rex Railporter Catalog. Write for Bulletin 56-47.

CONSTRUCTION REX MACHINERY

MOTO-MIXERS · BUILDING MIXERS · PUMPCRETE · RAILPORTER · PUMPS

CHAIN BELT COMPANY

PAVERS · SPREADERS · FINISHERS · FLOATS · CURING MACHINES · FORMS

Correctly engineered to bear heavier loads, lengthen rope-life, reduce maintenance costs

• Because they're designed and engineered for specific tasks, you'll find MADESCO blocks with heavy steel shells and fittings your *safest* choice. In materials, in construction too, Madesco tackle blocks assure you the extra service that comes from over thirty years of specialized experience and "know-how." Buy Madesco blocks and you make substantial savings on your rope costs, because Madesco sheaves (of iron or steel graphite bronze) are correctly-grooved to prolong rope-life. Loads travel smoothly, easily, quickly to save lifting time; that means savings too that come from minimized maintenance and down-time. There's a complete line of Madesco tackle blocks for every need. Consult your industrial distributor—and meantime write for our catalog.

WORTH ASKING FOR—BY NAME

MADESCO BLOCKS

MADESCO TACKLE BLOCK CO., Easton, Pa.

*Lightweight, portable air-cooled engine drive

AC Power—AC Welding anywhere!

No contractor can afford to be without this valuable 2-in-1 unit that gives you welding current anywhere for maintenance, repair and construction—and with a flip of the switch gives you 110 volt AC current for tools, lights, motors. Your own men can use—you save hundreds of dollars by doing your own repair work—by having current available for welding or power when and where you need it. Coupon brings complete information—no obligation.

Cut costs—save hundreds with this lightweight portable welder. Save on replacement parts. Avoid costly delays and down time. You make repairs right on the job.

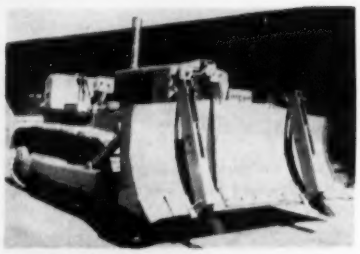
250 amp. "Contractor's Special"

"Husky Boy" Air-Cooled

HOBART BROTHERS CO. Box 647, Troy, Ohio, Ph. FEderal 2-1223.
Without obligation, send complete information on the equipment I've checked below.
_____amp. capacity ☐ Arc Welder with 110 v. auxiliary power ☐ Husky Boy Air-Cooled Arc Welder ☐ 250 amp. Water-Cooled Welder ☐ Standard Water-Cooled Gas Drive.
Name_____Position_____
Firm_____
Address_____

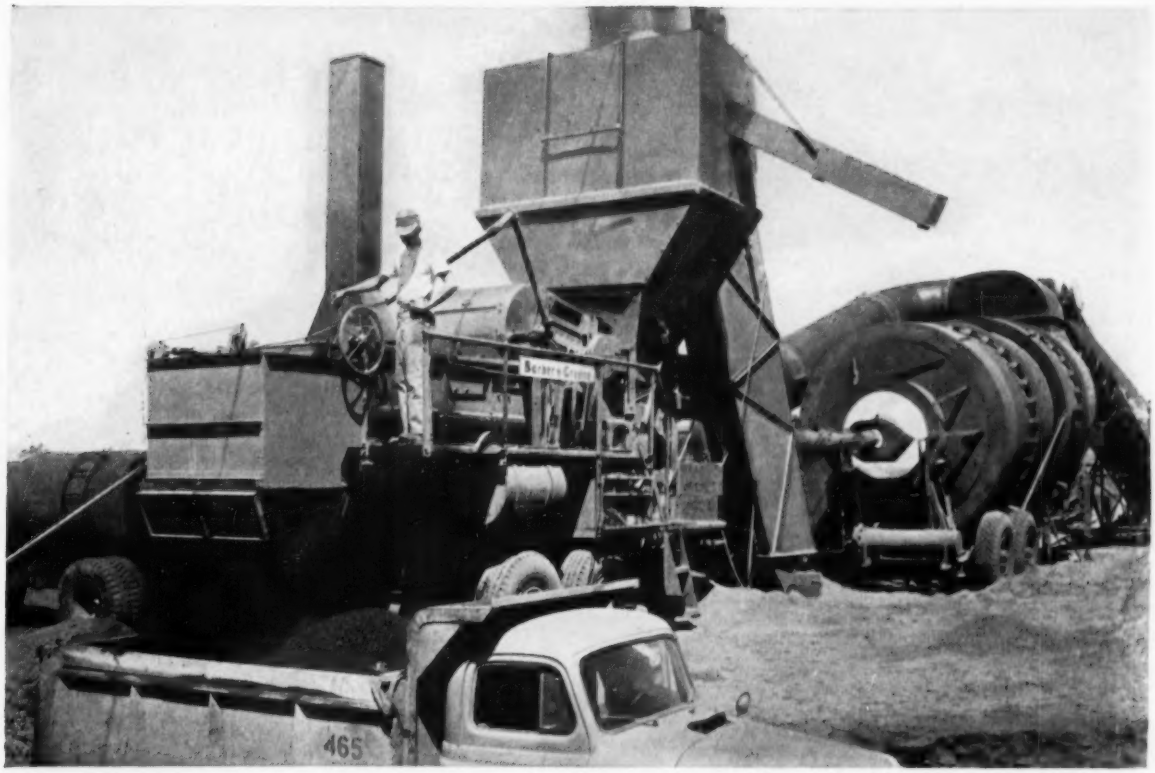
HOBART "One of the world's largest builders of arc welding equipment"

segments. These permit the operator to shift to one of three cutting depths to match soil conditions. Other features include roll-out ejection and double ball bearing sheaves that assure accurate sheave alignment. Low draft arm connections and outside-mounted apron arms provide fast, positive loading action. When sideboards are used, the material-handling capacity of the new units are 22-yd heaped for the 4S-85 and 15-yd heaped for the 4S-55.—**International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**



RUGGED RIPPER—Ransome has introduced a new ripper designed for attachment to bulldozers 43 to 60-in. high in the 150 to 320-hp tractor range. Called the model R-89, the ripper has a 4x7-in. ripping shank and a newly designed 28-lb cast manganese tooth. One man can easily adjust the rack and pinion depth adjustment in a minimum of time.—**The Ransome Corp., 2729 Hunting Park Ave., Philadelphia, Pa.**

NEW FORD LINE—Ford's 1957 truck line, which covers more than 300 different models, features new pick-up models with streamlined load areas 25% bigger than last year; a new series of six tilt-cab transport trucks said to be the lowest priced in the industry; medium and heavy-duty models with increased payload capacities; and the new Ranchero, which combines passenger car styling with all-around pickup truck utility. Engine power throughout the line has been raised an average of 8%, according to the company. Engine



48 hours after this picture was taken, this asphalt plant was operating 70 miles away

In its first season of operation, this Barber-Greene Model 848 continuous plant was moved to six different job sites . . . produced 111,315 tons of quality hot mix in 555 hours of operation for an average of 200 tons per hour.

All plant components are mounted on rubber-tired chassis for over-the-road towing at truck speeds.

Gradation Control Unit Added

Typical of the many Barber-Greene plant owners, this Minnesota contractor operated with the basic equipment first and later purchased the Gradation Control Unit. He can meet any specification, and has the flexibility of towing the Gradation Unit only to those jobs requiring screening after drying.

Inherently Automatic

Plant operation is based on the Barber-Greene continuous principle which is inherently automatic. Once the controls are set, the plant produces at top efficiency and accuracy.

Barber-Greene manufactures a complete line of continuous and batch asphalt mixing plants with capacity ranges to meet your production requirements.

Same continuous plant with Gradation Control Unit added.

Write for literature on any continuous or batch plant in Barber-Greene's complete line. 56-2-A

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

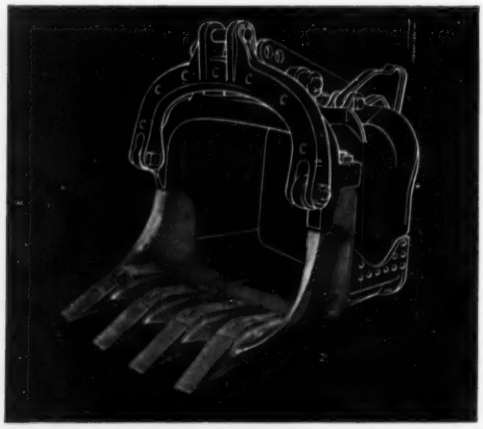
THIS AMSCO® LIP TAKES A SHARPER BITE

. . . chews out full loads at normal power

The lip juts way out where it easily bites up—and delivers—the full yardage of coal. It's a sharp *extension* of the dipper, with fanned teeth—for fast, easy penetration. The dipper digs out a heavier load without strain on the shovel . . . even requires less power, and prolongs life of all parts.

This Amsco lip lasts a long, long time, because it's made of the toughest steel known—manganese steel—the metal that work-hardens to fight off wear by impact and abrasion. Lip replacement is simple, when necessary, keeping downtime short.

If getting more pay loads moved faster with less wear on equipment means more profits to you, *specify Amsco Renewable Lip Dippers.*



AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

COMMENT
from the
BUTLER ENGINEER

Of Expansion and The Sensational TX-4

You know, in a manner of speaking we are operating a store here at Butler Bin.

We don't have merchandise on shelves but our stock in trade is engineering knowledge and long, long experience. Try dealing with our store. I think the quality will become evident.

Incidentally we've expanded the floor space in our engineering store so we're ready. We've greatly enlarged the fabricating area . . . and for good measure we're putting in a new and larger scale department.

Just by the way of evidence of the fantastic growth in the Ready Mix industry we're designing a Ready Mix Plant that will be completely and automatically controlled by TWO punched card batchers. Who could have dreamed of such production—say ten—no even five years ago.

One gets wondering where all the incredible volume of concrete goes. But stop and think. Sure, there's a lot of big building construction—and the highway program eats up concrete with a ravenous appetite. But how do you account for the enormous number of Ready Mix Plants even in very small communities. That, gentlemen, is where a perfectly huge volume goes. It's the home-owner who decides to put in a concrete driveway . . . a walk to his front door . . . the new subdivisions.

Ask yourself how much concrete you have in your own yard. OK? Now multiply that by millions!

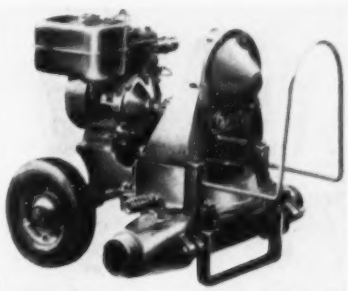
Ask us — if you're a Roadbuilder — about the new Butler automatic TX-4 Roadbuilder's Plant. Built to handle 1, 2, 3 or 4 dual drum pavers. All one man operated.

Best regards —

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

features include a new rotor oil pump for more effective lubrication; a dry-type air filter that cleans easily; new heavy-duty carburetors; and lighter flywheels that permit faster acceleration. Hydraulic clutches are now standard for the whole Ford line at no added cost. Four basic power plants are offered, with 27 different modifications available for special applications. The Styleside pickup body is available on nine light-duty models. Ford's largest selling truck, the F-100 pickup, now has a GVW rating of 5,000 lb, and its load space has a capacity of 56.05 cu ft. Ford's medium and heavy-duty line (T-750, above) features truck frames that have been strengthened by increasing the depth of the side rails over the axle. On larger models, four venturi carburetors are used for more efficient mixing and combustion. GVW ratings have been increased throughout the line.—**Ford Div., Ford Motor Co., Plymouth and Middlebelt Rds., Dearborn Mich.**



LIGHTWEIGHT DIAPHRAGM PUMP—Carter has added a 3-in. diaphragm pump weighing only 125 lb to its Humdinger line. Called the model 3 ADF, the easy-to-handle pump is rated at 4200 gph, although it has handled twice this capacity in tests. The body design of the pump allows full displacement action of the diaphragm so that its capacity is achieved on every stroke. The pump body and housing are cast of aluminum alloy especially selected for its resistance to abrasion. Streamlined waterways minimize internal friction. Other features include a sealed housing; a continuous oil-bath lubrication system; spring-cushioned connecting rods to absorb strains; and check valves of neoprene with oversize weights that insure positive seating.—**Ralph B. Carter Co., Hackensack, N.J.**

continued on next page

We Made Double Savings By Pouring Slabs and Columns With the Same Forms

R. B. Barkley, President, Sanford Construction Co., Sanford, N. C.

"We used Atlas Compo Forms to pour culvert slabs for the Winston-Salem East-West Expressway, then used the same forms to pour 30-feet columns. The slab set-up moved easily and quickly and your wedge system eliminated all seepage. On the column set-up a small crew was able to pour two columns each day. We are extremely well pleased."

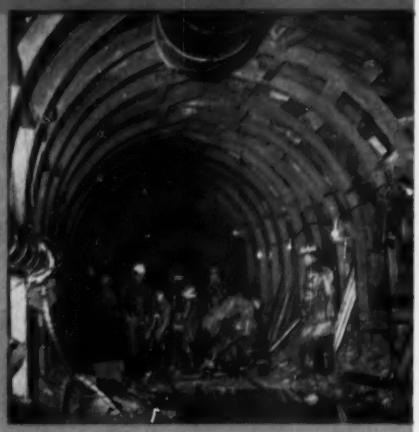
ATLAS COMPO FORMS

For the easiest and most economical forming on your next job, write or call us now. Atlas Compo Forms are backed with a *cash guarantee of labor saving.*

IRVINGTON FORM & TANK CORP.
20 Vesey Street
New York 7, N. Y.

GOODALL *Waterproof*
CLOTHING • FOOTWEAR

Tops . . . in Protection, Comfort, Long Wear!



COATS • JACKETS • OVERALLS

Durable, full-cut garments, in rubber, oiled and latex constructions, for every kind of wet-weather work. Made of selected materials, with exacting craftsmanship, they are guaranteed waterproof, assuring complete protection from the elements. Reinforced where extra strength is needed, without impairing comfort and full freedom of movement. Available in a variety of styles, in all sizes. No. 338 Coat is an old-time favorite—double back; corduroy-lined collar; 49" long.

SUITS—Style 80 Jacket with Style 81 Overalls makes the ideal shaft suit. Other jacket-and-overall suit combinations to meet every preference or job requirement.

SAFETY HATS

"Hardboiled" Safety Hats in fibreglass or aluminum. Light weight and comfortable, yet providing greatest possible head protection. Exceed highest established requirements for strength, heat and moisture resistance, and dielectric tests.

"TOE-SAVER"® BOOTS

Smooth, tough, flexible black rubber, heavy duck lined Cushion Insole. White cap over reinforced steel safety toe tested to withstand 2,000 lbs. pressure. Tiretread soles. Hip, Storm King and Short. *All permanently marked size numbers.*

The "Toe-Saver" feature is also available on a variety of work shoes, and on our "Contractors" Mucker Boot.

"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch for Details and Prices

Standard of Quality—Since 1870 HOSE • BELTING • FOOTWEAR • CLOTHING AND OTHER INDUSTRIAL RUBBER PRODUCTS

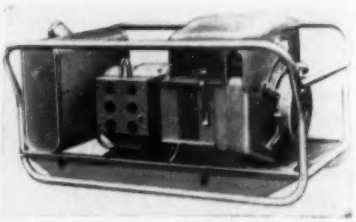
GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches and Distributors Throughout the United States and in Canada

EQUIPMENT NEWS . . . continued

DEPTH INCREASED—The new model Henry Super C-10H backhoe now digs down to 12 ft with a telescopic boom, and down to 10-ft with a standard boom. Both models load 8½ ft high. The telescopic boom actually lowers the crowd cylinder down into the hole, so that it exerts the same power at every level of the digging operation. Both the telescopic and the standard model are available with either hydraulic or manual outriggers, which, according to the manufacturer, will level up the machine for straight down digging even on 25% slopes. The main frame of the backhoe rests solidly on the ground, so that there is no backhoe weight on the tractor while digging. It makes 6 sq ft of contact so that the danger of tipping when swinging heavy loads is eliminated. The boom swings 160 deg and can dig at any angle within that arc.—**Henry Mfg. Co., 1700 N. Clay St., Topeka, Kan.**



DC POWER PLANT — A new portable 5,000-w dc electric generating plant, powered by an Onan two-cylinder, air-cooled gasoline engine rated at 12.9 hp has been marketed by Onan. The engine is designed especially for smooth running, heavy-duty electric plant applications. Of drip-proof design, the generator is rated at 5,000 w, 1115 v. Total weight of the unit

continued on page 264

THE OLIVER SUPER 88

"Saves as much as 50% over other equipment"

On this big $15,000,000 shopping center project, Jos. L. Muscarelle, Inc., well-known contractor of Maywood, N. J., has an Oliver 88 on a 5-day-a-week schedule. Working right through the winter—and in frozen ground—the 88 handled all trenching for sanitary sewers, water and electric lines and spot excavations as well as all backfilling. Odd jobs include loading trucks with sand at a nearby pit, as seen above.

The 88 is also used to excavate in cramped areas where steel beams have been erected—and where larger machines can't operate. Here, too, the compact, powerful Super 88 has set up some amazing cost records.

Averages 550′ per day of 5′ trench

So far, the 88 has dug over 25,000′ of trench ranging from 3′ to 11′ deep. Average production for 5′ trenches—at random lengths, in all directions—totals 550′ per day. Cost records show that the Oliver 88 saves as much as 50% in over-all costs over other ½-yd. equipment for this type of work. And the user reports, "No repairs, no breakdowns since the Oliver Super 88 was purchased"—8 months ago!

Ask your Oliver distributor for facts about the Super 88. Or write us for literature.

OLIVER **THE OLIVER CORPORATION**

400 West Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors and matched allied equipment.

WHILE STEELWORKERS place a sling on the next beam to go up, this American 100 Series lifts open web joists into position. The job is a new terminal building at the Pinellas County (Florida) Airport. When completed, the terminal will give passengers service to St. Petersburg, and a 25-mile auto trip from Tampa will be eliminated!

NEW 12½-TON AMERICAN CRANE SETS STEEL SMOOTHLY, SAFELY

A modern terminal building and control tower are part of the new Pinellas County Airport that will serve St. Petersburg, Florida. Johns Contracting Company, Tampa, is using their American 100 Series Truck Crane for steel setting on this job. Working with up to 85 feet of boom, the 12½-ton capacity American frequently handled loads weighing up to 5 tons. Lifts ranged up to 71 feet high! More than 120 tons of structural steel are used in the terminal building.

NEW MODELS of the 100 Series Americans now in production offer steel erectors precise accuracy. An optional two-speed transmission permits steel beams to be "inched" into position without excessive jerking or dangerous shock load stops. Perfectly smooth boom control—even with longest boom at maximum radius—results from American's overrunning sprag clutch. With this feature you have 100% boom control. There's not an inch of drop when you start the boom up or down. Steel is handled smoothly, safely, speedily!

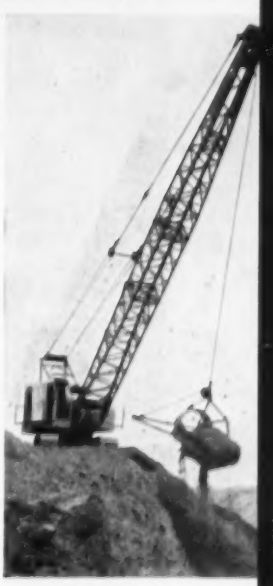
See Americans working right *on the job*—talk to owners and operators! Ask your nearest distributor to show you American crawler and truck cranes in action. With any front—backhoe, shovel, dragline, clamshell or crane boom—in any capacity from ½-yard, 12½ tons on up, you'll see, in person, why American is the fastest growing crane line!

(Advertisement)

BOOMED WAY DOWN, the American 100 Series Truck Crane reaches out for another beam. Americans meet steel erectors' demands for precise, positive boom control and plenty of power to keep jobs on schedule. Combining low initial cost with low operating cost, the 100 Series is an extremely versatile machine that operates with any front. As a truck crane its high speed mobility carries it from job to job with minimum travel time. On crawlers, the 100 rolls over tough terrain—its wide undercarriage offers unusual stability, yet has a full 13½-inch clearance.

REACHING UP to a bridge deck to place concrete is an American 300 Series Crawler! On this turnpike job the contractor uses his American to drive piles, handle forms and place concrete. American crawler and truck cranes accommodate all fronts—offer a complete line that meets every contractor's needs. American distributors, who have detailed information on the entire line, will study your requirements, help you select the exact models best suited to your operation. Call your distributor or write direct.

NOW CELEBRATING its 75th year of service to the construction industry, American Hoist actively continues its program of product development and refinement. Most recent outgrowth of this plan are the American 100 and 200 Series machines. These crawler and truck cranes offer capacities of ½-yard, 12½ and 15 tons; ¾-yard, 22½ tons. They bring work proved American performance and efficiency to contractors with jobs requiring smaller capacities, but maximum crane efficiency and ruggedness. Remember, there's an American Crane for your job—no matter how small or large!



SETTING THE PACE on big projects is American's big producer—the 700 Series! Working capacities are 2-yards dragline, 1½-yards rock shovel and backhoe. For steel erectors, 50 tons capacity on crawlers or truck crane. Finger-tip air controls give operators immediate response to every command. As a result, every move of man and machine counts! For sustained high production on the bigger jobs, it will pay you to investigate the American 700 Series!

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

DRY IT OUT WITH ROME DISK PLOWING HARROWS!

Heavy rain last night — mud this morning? A few hours cutting and aerating the site or haul road with a crawler tractor and Rome Disk Plowing Harrow can save the day! On the cut a Rome loosens and dries material to full scraper-blade depth, facilitating loading. On the haul road, it fills in ruts, helps dry out the slick surface. The Rome Disk Plowing Harrow can be hitched or unhitched from the tractor drawbar in *seconds*, immediately releasing the tractor for other work.

Rome Disk Plowing Harrows are ideal contractors' machinery for blending in-place materials or soils, for stablizing road shoulders, dam fills or bridge sites. These multi-purpose machines can reduce your equipment investment, cut operating costs, speed up production.

Rome Disk Plowing Harrows can speed up land clearing, too, cutting out brush and springy young trees too flexible for efficient 'dozer work.

Your Rome-Caterpillar Dealer will gladly help you select the machine you need for your project. See him soon!

ROME PLOW COMPANY, Cedartown, Georgia

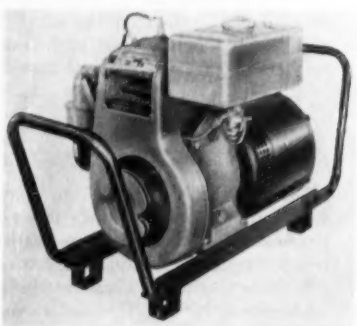
Rome Disk Plowing Harrows

EQUIPMENT NEWS...

continued from page 260

is only 315 lb. The generator is directly connected to the engine for positive, permanent alignment. Standard equipment includes a six-outlet receptacle box with pilot light, a mounted six-gal fuel tank, a carrying cradle, vibration dampeners, and a pull-type starter.— **D. W. Onan & Sons, Inc., 2515 University Ave., S.E., Minneapolis 14, Minn.**

NEW TRANSCRETE MIXER — Construction Machinery Co. announces the addition of the new model 550 Transcrete to its line of truck mixers. The new model has a drum volume of 243 cu ft, and it carries a mixer rating of 5½-yd. As an agitator only, it carries 6 to 6½ yd. The truck is available with optional Ford or Chrysler separate engine power. CMC's truck engine drive is also available. Features of the truck include floating drive, swing-out hopper, and a low center of gravity. The addition of the new mixer gives CMC five units that will mount on a variety of standard carriers to meet local conditions. **—Construction Machinery Co., Waterloo, Iowa.**



GENERATOR WITH EXTRAS— Close voltage regulation and generous overload capacity are among the features of the gasoline engine-driven generator recently introduced by Homelite. The new 3,000-w. generator, called the model 41,

GENERAL

NYGEN® TIRES

move 465,000 cu. yds. of dirt to meet 120-day deadline date for Berghuis Construction Co.

Stronger than Steel
NYGEN®
... the most indestructible cord ever built into a tire
... exclusive with
GENERAL

Where time is a vital factor, the sure-footed, crawler-like traction and flotation of General Truck Tires can be counted on to get the job done faster and for less.

Built tougher for the toughest jobs with exclusive Nygen Cord construction and featuring extra wide treads for positive traction, Generals are unexcelled for drive, durability and dependability.

Put Nygen-built General Truck Tires to work tomorrow on your toughest job and let them prove their worth in time saved and profits made.

THE GENERAL TRUCK TIRE

specify Generals on your new equipment

THE GENERAL TIRE & RUBBER CO. • Akron, Ohio

Stones and rocks made digging tough.

Compact rugged Cleveland's smooth crawler mounting real public relations asset in 70,000′ tough digging

The light weight, hi-tensile alloy steel construction and smooth crawler mounting of this Cleveland 92 "Baby Digger" enabled Rich & Co., Bradford, Pa. to cut 70,000 feet of trench in stony tough digging without causing damage to the sidewalks and fine old lawns in and around Groton, N. Y. The compact design and quick-and-easy maneuverability of the 92 were other big helps in digging these 4-inch pipe gas mains and laterals for New York State Electric and Gas Co., Ithaca, N. Y. The rugged 92 weighs only 10,000 pounds, is only 4½ feet wide over its crawlers, yet digs 10 to 20 inch trench widths and down to full 5 feet deep—in *all* soils.

The 10,000 lb. 92 treads lightly on lawn and sidewalks.

Compact 92 can put trench within 20" of side obstructions.

Good Everywhere

THE CLEVELAND TRENCHER COMPANY

20100 St. Clair Avenue • Cleveland 17, Ohio

will provide dependable power for floodlights, portable electric tools, and emergency stand-by service. Simply constructed to reduce maintenance costs, the generator has no BC brushes, commutators, DC windings, or intermediate couplings. Ruggedly designed, the lightweight unit can be located close to the job needing power, thus eliminating the need for long, power-robbing electric cables.—**Homelite, Port Chester, N.Y.**

FAST FORM SPRAYING—Hydro-Fog is a new power-driven unit for spraying assembled forms quickly and safely. The operator has only the hose and a 3-ft long spray tube to handle, instead of carrying a bulky pack while cat-walking over forms. A self-contained unit, the Hydro-Fog is complete with the power supply, the fluid tank, and 60 ft of hose. Use of the unit is said to reduce consumption regardless of the type of spray fluid because the high pressure gun provides a fog blanket that quickly covers form surfaces. Pressure up to 300 psi is provided through a 72-gph self-priming pump driven by a 2-hp Clinton gasoline engine. The tank capacity is 30 gal. The unit weighs 310 lb when filled and measures 32x22x32-in. — **Hydro-Fog Equipment Co., 2500 N. Main St., Rockford, Ill.**

MIXER TRUCK PTO—A front-mounted power take-off unit that can be installed in the field on International trucks with Red Diamond engines has been introduced by International Harvester's motor truck div. It is designed primarily for use on transit mix trucks. Rated

continued on page 270

Got A Tough Digging Job?

• SOFT GROUND

• DEEP WATER

• NARROW SPACE

• STEEP HILLS

Use A Sauerman DragScraper

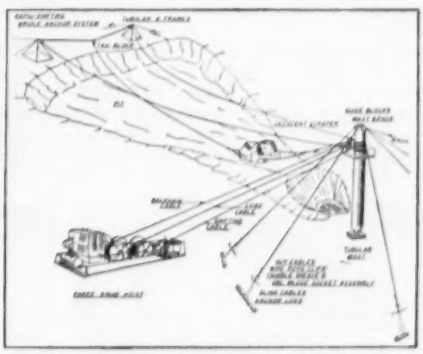
• **SOFT GROUND**—Sauerman DragScrapers work on surfaces where wheeled equipment cannot go and where mats are required to operate a dragline. The DragScraper digs and hauls its load quickly at ground level to hopper or pile. It carries a payload of two to three times its weight. You are not paying the power costs of a heavy machine with a handling capacity that is just a small portion of its weight.

• **NARROW SPACE**—A DragScraper can be operated through an opening no larger than the bucket's width. They are used successfully in culverts, sewers, tunnels, under bridges and buildings. Locations with limited space and head room . . . unworkable with other equipment . . . are handled efficiently and economically with a DragScraper.

• **DEEP WATER**—A Sauerman DragScraper will dig as much as 100 ft. below water . . . this is far below the safe depth that a dragline bucket can go without the danger of undermining and overturning the machine. Use a DragScraper for trenching, digging channels, lakes or for beach construction.

• **STEEP HILLS**—These are routine for a DragScraper. Material can be taken from anywhere on the bank. Digging from the top of the slope eliminates cave-ins—and the DragScraper gives an extra bonus by pushing additional material in front of the bucket on its way down the slope.

The Sauerman DragScraper operator and hoist is always located away from any hazardous area. It is designed for years of safe, continuous duty, handling bucket sizes up to 15-cu. yds. over spans to 1000 ft. or more.



THE SAUERMAN METHOD—*showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

When you have a "tough-to-handle" job consult Sauerman engineers about Sauerman equipment and the Sauerman Method. Request Catalog A, also the Sauerman News and field reports.

SAUERMAN BROS., INC. 612 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

New specialized off-highway V-8

Another reason why contractors find International Trucks cost least to own!

A new six-wheeler designed exclusively by INTERNATIONAL for heavy-duty off-highway work—with the most powerful truck-type engine in any comparable truck. Tough, husky construction to perform profitably under the most rugged conditions!

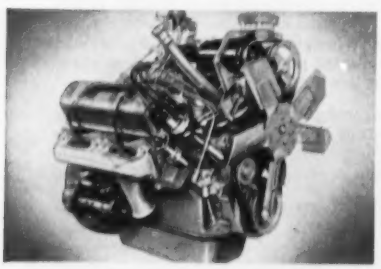
Here is more evidence of the INTERNATIONAL policy to build the trucks that operators want and need . . . trucks with only the highest quality components, the biggest selection of components to stay on the job longer at *least* cost. And INTERNATIONAL Trucks do cost *least* to own—fleet owners' cost records prove* this.

Why not get more proof yourself? See or call your INTERNATIONAL Dealer for all the facts. Do it today.

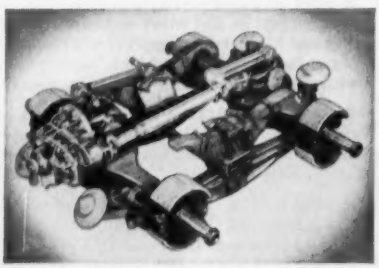
**Signed statements in our files, from fleet operators throughout the U.S., back up this statement.*

INTERNATIONAL HARVESTER COMPANY, CHICAGO

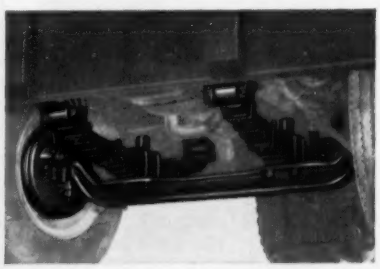
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



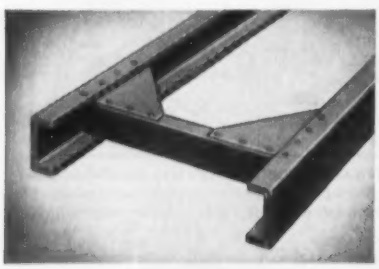
1 **Most V-8 power in any truck,** 257 hp. New VF-230 model has load-moving ability unlimited, power to haul the biggest loads anywhere. Other six-wheeler power plants include sixes and new V-8's—gasoline, LPG and diesel engines up to 356 hp.



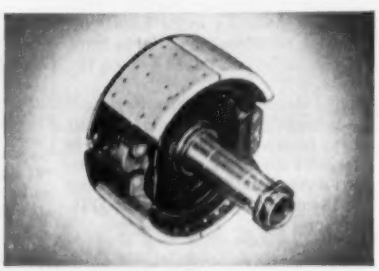
2 **INTERNATIONAL tandems** give longer, more dependable life. This heavy-duty, double reduction unit has 46,000 lbs. capacity. Sturdy cast steel housings. Third differential with lock transmits power smoothly, evenly to each axle.



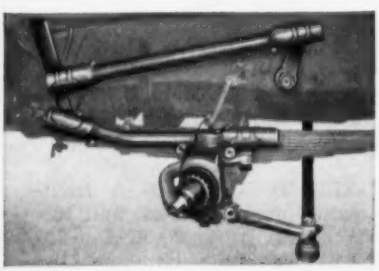
3 **Balanced heavy-duty front end** for maximum loading, added stability and longer life. 15,000 lbs. capacity heat-treated high carbon steel axles, 4-inch wide springs with threaded pins and bushings. Available on several other models.



4 **Steel-Flex frames** combine great strength with proper flexibility. New models have straight-through, double channels made of heat-treated alloy steel. Reinforced cross-members with husky gussets for sturdy, lasting tandem suspension.

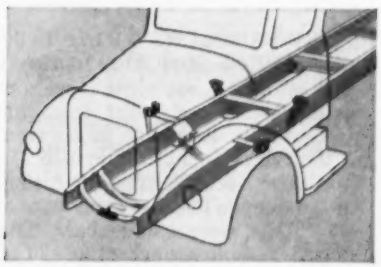


5 **Efficient, fast-acting air brakes** are standard on new VF-230 model—17½ in. x 3 in. front, 16½ in. x 7 in. rear with 1,162 sq. in. total lining area. Other six-wheel models with brake types and sizes to match the load and operation *exactly*.



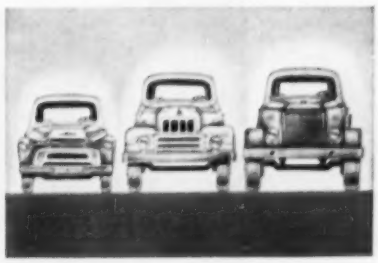
6 **True geometric steering** provides easier handling and outstanding maneuverability. Heavy-duty gears are cam and roller-mounted twin lever type. Controls mounted *ahead* of the front axle. Power steering standard on VF-230 model.

Latest addition to the world's most popular line of six-wheel trucks—new INTERNATIONAL Model VF-230 with 60,000 lbs. GVW. Built to absorb severe shock loads, to stand up under the most extreme applications. Engine is the industry's most powerful V-8, *257 hp.* Other new off-highway V-8 six-wheelers available, plus models from 22,000 to 76,800 lbs. GVW in conventional and COE design. Complete selection of all-wheel-drive models, too.



7 For cab comfort and long life. Quiet, level ride without transmitting stress to cab, fenders, hood or radiator. It's the result of wide spaced, rear shackle type mountings in an exclusive INTERNATIONAL 5-point, rubber-insulated cab suspension.

8 All-wheel drive models have the extra traction and pull needed for all tough, off-highway operations. Completely factory-built, 7,000 to 43,000 lbs. GVW. Low height with ample ground clearance. Complete selection of equipment available.



9 World's most complete line. There is an INTERNATIONAL "tailor-made" for every truck job, ½ tonners to 96,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own!

TRANSFER LIQUIDS *Faster Easier Safer* with Bennett Big G Hand Pump

Double-action Big G Transfer Pump provides the safest, easiest and most convenient way to transfer liquids. Pumps up to 20 gallons a minute and lifts up to 20 feet.

Every stroke is a pumping stroke. Automotive-type piston design eliminates troubles common in cup-leather and diaphragm type pumps.

Available in a variety of models to fit your pumping needs.

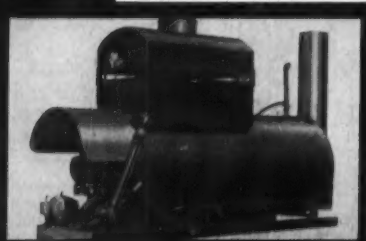
JOHN WOOD COMPANY • Bennett Pump Division • Muskegon, Michigan

IN CANADA: JOHN WOOD COMPANY LIMITED Toronto • Montreal • Winnipeg • Vancouver

BEST IN THE LONG RUN

GET MORE COMPACTION WITH LESS DOWN TIME WITH GRACE PNEUMATIC ROLLERS — 7 TO 60 TONS.

GRACE HEATERS AND COMPACTORS



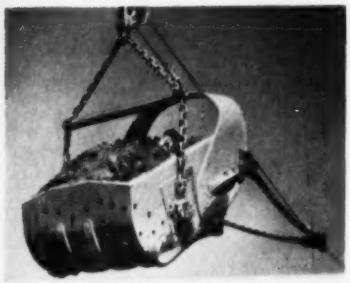
Oil heaters for automatic heating of hot plants, save labor, fuel and water — also Rapid Fire circulating asphalt heaters.

W. E. GRACE MANUFACTURING CO.
6100 S. LAMAR DALLAS, TEXAS

EQUIPMENT NEWS . . .

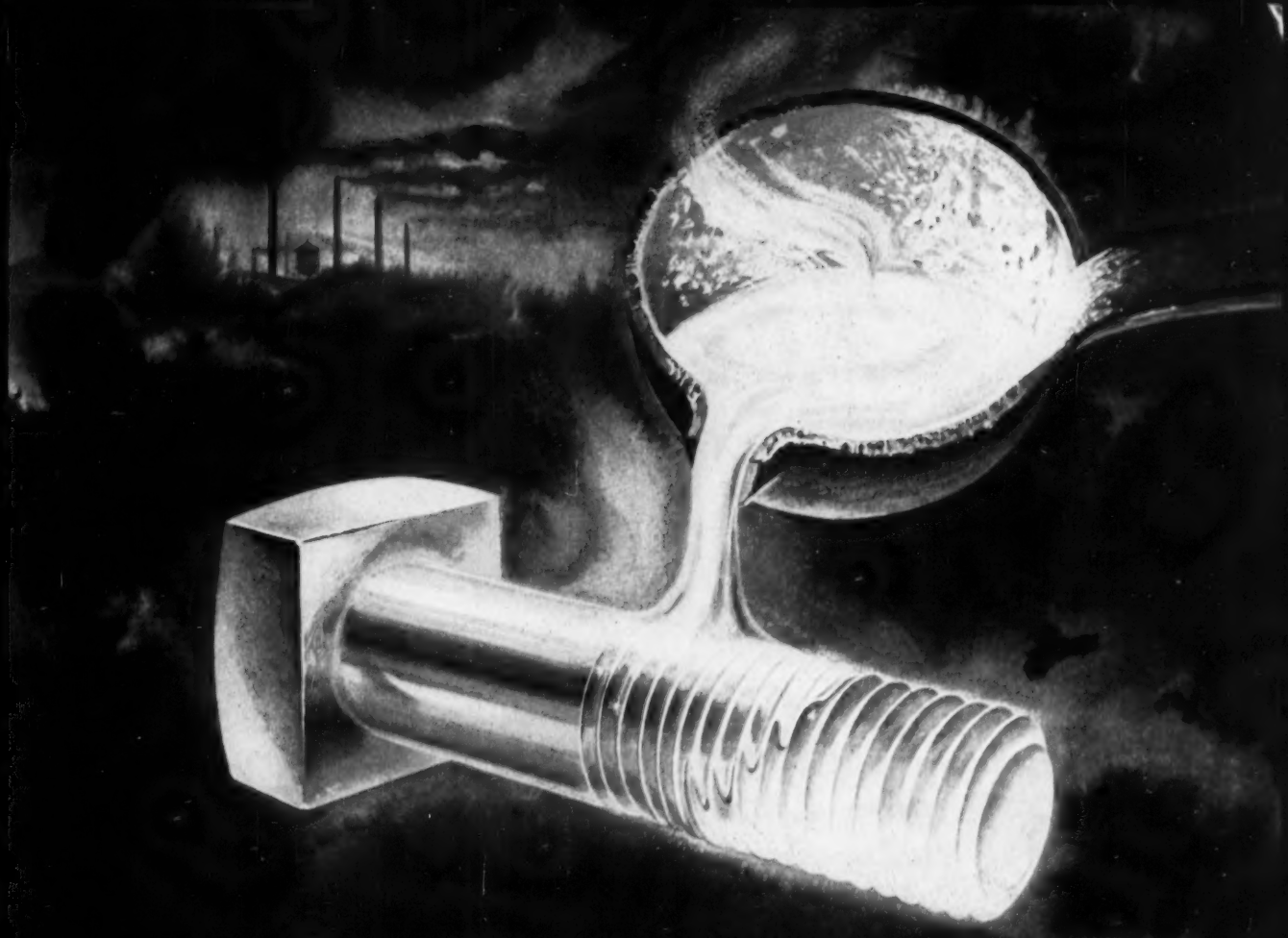
continued from page 267

capacity of the assembly is 50 hp at 2,100 rpm. It drives a shaft attached to a mixer transmission, which in turn furnishes power at reduced speed to the mixer barrel. Greater payload capacity for mixer trucks is provided because there is no need for a separate mixer engine. Power to the mixer is not affected by clutch operation.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**



LIGHTWEIGHT BUCKETS—A new line of Page series A dragline buckets, with capacities ranging from ½ to 3 yd, has been introduced by the Page Engineering Co. The buckets are lighter in weight than previous Page buckets, but retain the rugged construction features and automatic digging action of previous buckets, according to the manufacturer. Among the features of the new buckets are a heavier one-piece bottom plate, an improved lip design, a two-position hitchplate, a smooth acting dump block, reversible tooth points, and heat-treated alloy steel hoists and load chains. The Series A automatics are available in light-medium, general purpose, and heavy-duty classes. In all, the line offers 33 buckets.—**Page Engineering Co., Clearing Post Office, Chicago 38, Ill.**

EASY SAMPLING—Mobile Drilling's Hollow Stem auger permits undisturbed sampling without withdrawing the auger from the drilled hole. Available in dia from 7 to 10-in. OD, and 2¾ to 6-in. ID, the auger acts as its own casing. Available in lengths from two to 10 ft, the augers have been field tested to depths as great as 100 ft. A removable plug in the drill head on the lead auger prevents material from entering the auger core. When the desired depth has been reached, the plug is removed and the sampling tool is lowered



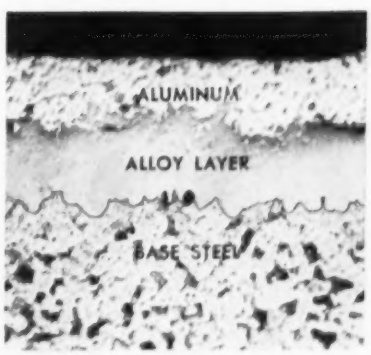
The illustration is symbolic — in practice, Bethlehem fasteners are dipped in molten aluminum, then centrifuged, producing a coating that is uniformly smooth over the entire surface.

Bethalume Coating for Fasteners is Superior in Corrosive Atmospheres

Looking for longer service life from steel fasteners exposed to corrosive conditions? Use fasteners which are protected by Bethlehem's Bethalume coating — the hot-dip aluminum coating which, in equal thicknesses, outlasts zinc in most corrosive atmospheres.

With Bethlehem's new coating facilities, fasteners of virtually all types and sizes can be coated with a smooth layer of corrosion-resistant aluminum. Excess coating is removed quickly while in the molten state, leaving the coated threads clean and sharp.

If you would like to know more about the Bethalume coating for fasteners, and the long service life it makes possible in atmospheric and heat corrosion, just get in touch with the nearest Bethlehem office.



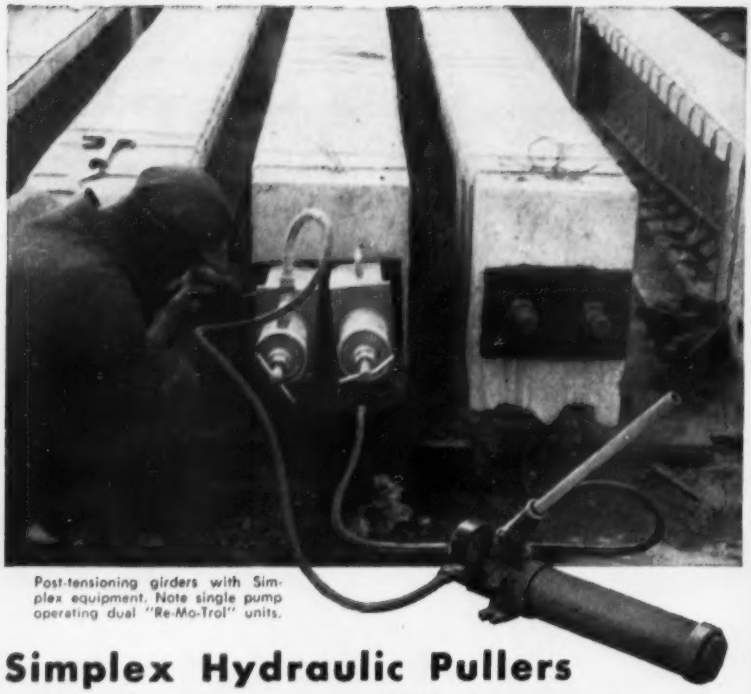
Section through Bethalume coating, showing aluminum overlay and iron-aluminum alloy layer.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Post-tensioning girders with Simplex equipment. Note single pump operating dual "Re-Mo-Trol" units.

Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations

Construction Men Acclaim Ease and Safety of Simplex Methods

Pre-tensioning and post-tensioning concrete becomes a quick, easy task with Simplex hydraulic equipment. Because of the "center-hole" pulling feature of Simplex units, wires, rods and cables can be tensioned without torque, "off center" pressures or complicated back-up devices. Eliminating these factors accounts for a 75% increase in ease and efficiency.

Simplex "Re-Mo-Trol" units consist of a "center-hole" hydraulic pulling ram connected by high pressure hose to a hand, air, electric or gasoline operated hydraulic pump. This powerful combination permits uniform stressing with maximum operator safety and speed. Once the ram is in place, the pump can be actuated safely from any nearby, convenient location.

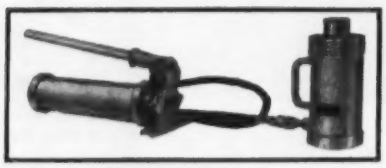
"Re-Mo-Trol" hydraulic pullers are ideally suited to prestressing operations at the job site and for use in permanent pre-tensioning beds. These versatile Simplex units are available in standard capacities from 10 to 100 tons, and can be used for heavy tonnage high-pressure tensioning of cables, rods or wires or for pushing or pulling against a holding bracket in multiple bed stressing operations.

The standard Simplex units provide a range of capacities sufficient for most applications. However, custom-built units are available up to 600 ton capacity.

Another Simplex hydraulic puller, the "Jenny", is a self-contained unit which serves as its own back-up or can be used with a simple chair to reduce set-up time.

Either device can be used not only as a puller but as a hydraulic jack or press for moving heavy equipment and the like.

For detailed data on the selection and application of Simplex Pullers for prestressing concrete and other construction jobs, write for your copy of our new bulletin: "Hydraulic 56".



SIMPLEX "RE-MO-TROL"—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure.

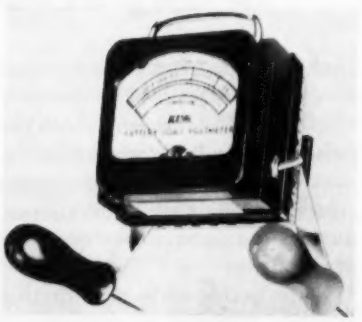
SIMPLEX "JENNY" is a hydraulically operated center-hole puller which also serves as a press or heavy duty jack. It is a self-contained unit available in capacities from 30 to 100 tons.

TEMPLETON, KENLY & CO.
2509 Gardner Road • Broadview, Illinois

EQUIPMENT NEWS . . . continued

through the hollow augers to the strata to be tested. According to the manufacturer, the Hollow Stem auger can be used in any instance where casing or pipe is normally utilized. Mobile Drilling's new B-52 Pacemaker drill, or any rig of comparable size and weight, is recommended for use with the new auger.—**Mobile Drilling, Inc., Dept. 18, 960 N. Pennsylvania St., Indianapolis, Ind.**

SHOVEL CLEANER—The Miller Hot-Box does a fast and thorough job of cleaning and scraping asphalt from shovels. The all-steel unit heats and cleans up to two shovels simultaneously in less than 2 min., according to the manufacturer. The propane-fired box mounts on all towed or self-propelled asphalt pavers. The unit comes with an empty 20-lb gas cylinder and the necessary mounting brackets.—**Miller Spreader Corp., 4020 Simon Rd., Youngstown, Ohio.**



CHECKS BATTERIES—King Electric's portable, load-type Battery Analyzer provides both detached and in-the-vehicle battery testing on 6 or 12-v units. The battery analysis is based upon a temperature compensated discharge-load that is said to give the true battery condition. Good, Recharge, and

continued on page 277

Double your secondary crushing capacity with a CEDARAPIDS PORTABLE PRIMARY

...and get all these other advantages!

- Work pits with high percentages of oversize
- Handle previously rejected boulders or big rock
- Meet 100% crushing specifications
- Open up pits considered unworkable or exhausted
- Convert your gravel plant to a rock plant

IT'S A PROVED FACT!

With a Cedarapids Portable Primary *of the size and type to fit your conditions* to handle the heavy crushing load ahead of your secondary equipment, you can double your plant capacity!

It adds a third stage of reduction to your operation, permitting your secondary crushers to handle twice as much material. It reduces the circulating load. More material will be taken off by the screen in your secondary plant before it reaches the crusher.

Equipped with a vibrating grizzly or scalping screen, your Portable Primary by-passes fines, sand, chips or dirt to prevent choking of the crushers.

You can turn *all* pit-run material, even big boulders, into specification 100% crushed aggregate. You'll have the capacity and flexibility to handle a wider variety of jobs . . . open up deposits considered unworkable because of excessive oversize or fines, re-open pits thought to be exhausted, operate in pits or quarries closer to the job to save hauling costs.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

THERE'S A SIZE AND TYPE OF CEDARAPIDS PORTABLE PRIMARY FOR EVERY PRIMARY REDUCTION JOB

Single Jaw Crusher

15" x 24" 25" x 40"
22" x 36" 30" x 40"

Twin Jaw Crusher

18" x 36"

with low-cost Vibrating Grizzly

Increases output of primary crusher up to 25% by by-passing fines before they reach the crusher. Three sizes available with single or double deck.

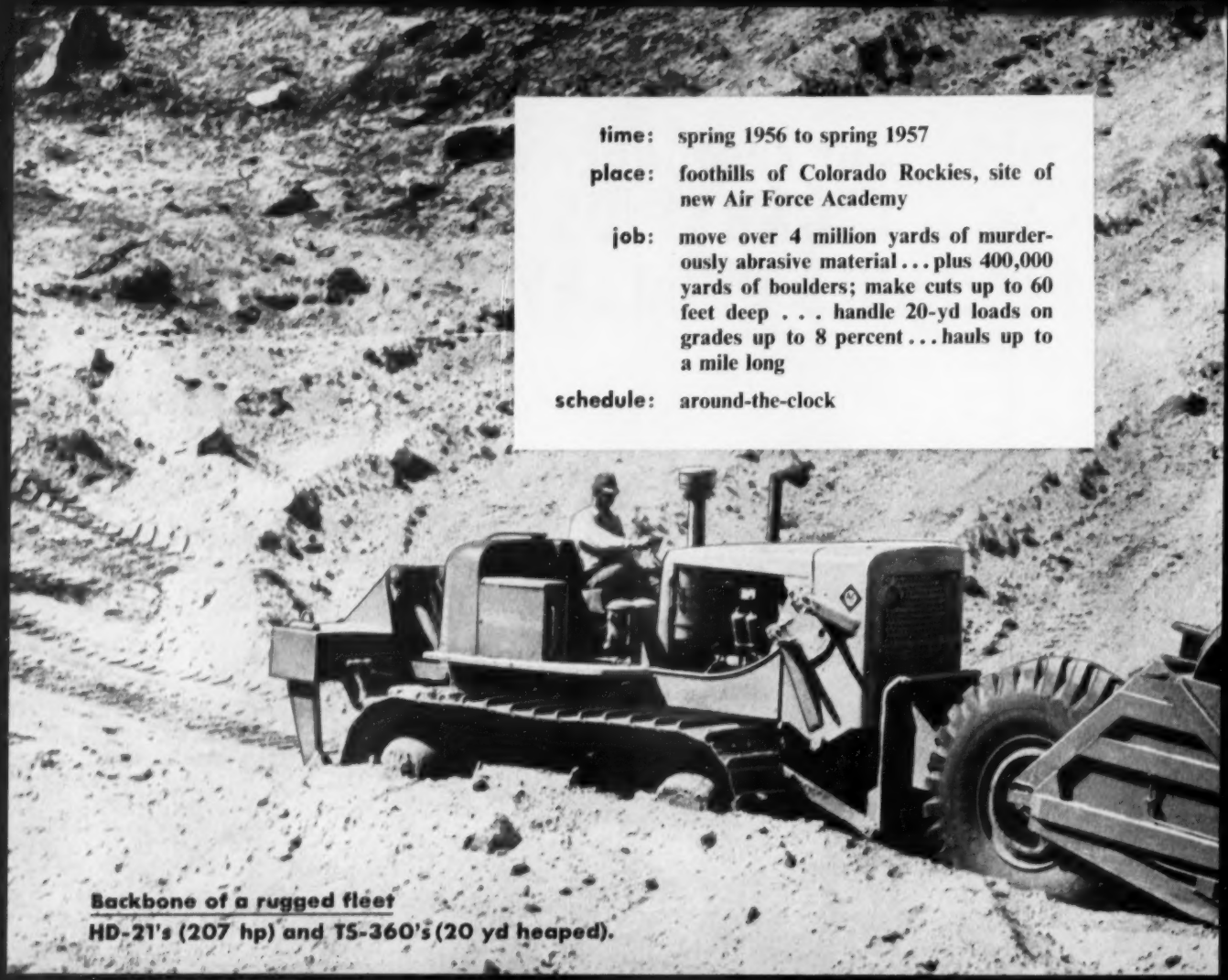
with Scalping Screen

48" x 6' horizontal vibrating screen between feeder and crusher increases production in pits with low percent of crushing, or where specifications require 100% crushed particles.

Portable Double Impeller Impact Breakers

30" x 42" 36" x 45"

With a reduction ratio of 20 or 30 to 1, this unit assures high capacity of desirable cubical shaped aggregate, which needs little or no further reduction.



time: spring 1956 to spring 1957

place: foothills of Colorado Rockies, site of new Air Force Academy

job: move over 4 million yards of murderously abrasive material . . . plus 400,000 yards of boulders; make cuts up to 60 feet deep . . . handle 20-yd loads on grades up to 8 percent . . . hauls up to a mile long

schedule: around-the-clock

Backbone of a rugged fleet
HD-21's (207 hp) and TS-360's (20 yd heaped).

YEAR'S TOUGHEST MOTOR SCRAPER JOB

Cutting as deep as 60 feet into abrasive dirt and boulder-ridden clay, this fleet of Allis-Chalmers machines accomplished what was one of the toughest jobs handled "on rubber" in the past year.

Tough grades, long hauls were part of every cycle on this Colorado Rockies job . . . but TS-360's consistently moved 20-yd loads fast on haul roads maintained by big Allis-Chalmers Forty Five motor graders.

—NOW COMPLETED...

with Allis-Chalmers construction machinery

A more severe test of modern, high-speed earth-moving methods and equipment than this Air Force Academy job would have been hard to devise. Big performance, rugged dependability . . . easy operation . . . simplified lubrication and service made Allis-Chalmers the choice at the start. Now, in spite of rugged operating conditions, that choice has been justified in a job well done. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

Save Hours with SHAWNEE®

Chief or WARRIOR TRUCK MOUNTED UNIT

Truck is heavy duty, 4-wheel drive with separate power takeoff to operate hydraulic pump.

- Exclusive "Push-Pull" Power—the Power with a "Punch"
- Digs 12-15 Feet Deep
- Sold as a Complete Unit or Mounted on Your Truck
- Mounts on Most All Popular Tractors

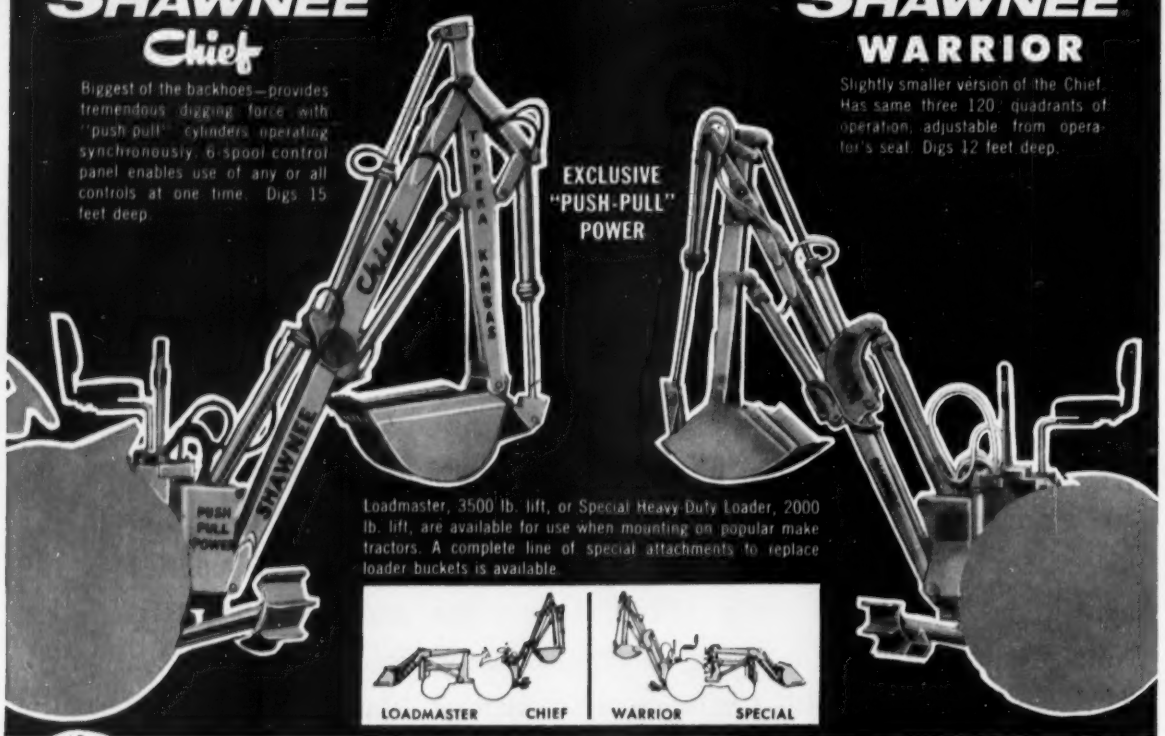
SHAWNEE Chief

Biggest of the backhoes—provides tremendous digging force with "push-pull" cylinders operating synchronously. 6-spool control panel enables use of any or all controls at one time. Digs 15 feet deep.

SHAWNEE WARRIOR

Slightly smaller version of the Chief. Has same three 120° quadrants of operation, adjustable from operator's seat. Digs 12 feet deep.

EXCLUSIVE "PUSH-PULL" POWER



Loadmaster, 3500 lb. lift, or Special Heavy Duty Loader, 2000 lb. lift, are available for use when mounting on popular make tractors. A complete line of special attachments to replace loader buckets is available.

For Additional Information, write

593

SALES AND SERVICE COAST TO COAST

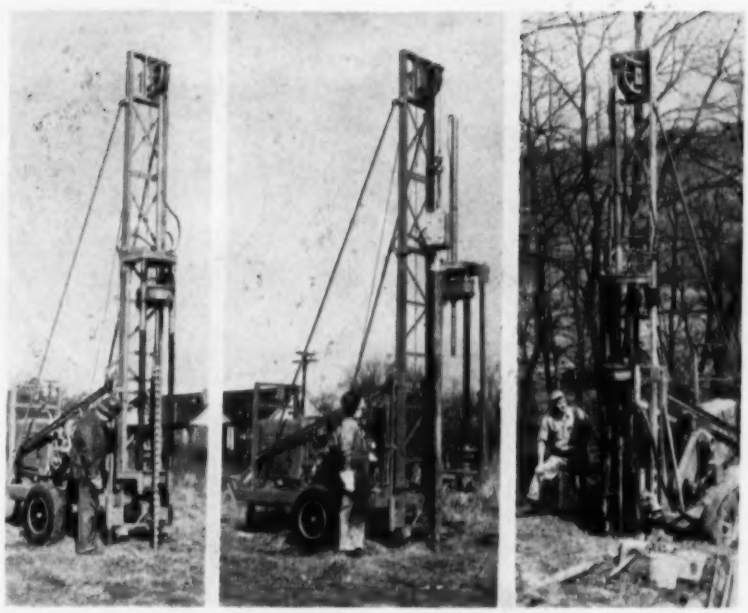
SHAWNEE® MANUFACTURING COMPANY, incorporated

1947-SS TOPEKA AVENUE • TOPEKA, KANSAS

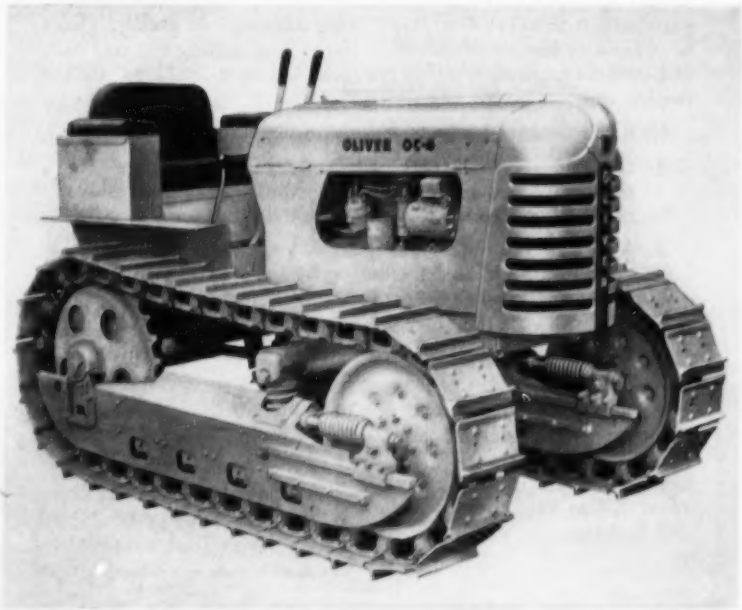
EQUIPMENT NEWS . . .

continued from page 272

Check-Each-Cell readings are provided on a brightly illuminated 5½-in. scale meter. Testing prods on the analyzer are adjustable for spanning the main posts of any vehicle battery, according to the manufacturer. A testing manual is provided with the tester, and an instruction plate is mounted on each unit.—**King Electric Equipment Co., 9123 Inman Ave., Cleveland 5, Ohio.**



THREE-IN-ONE—The Testborer is designed to increase the efficiency and accuracy of sub-surface exploration by incorporating into one portable unit the features of three basic methods of sub-surface drilling—augering, driving, and core drilling. The Testborer can auger to 150 ft; automatically drive pipe and casing to the same depth, automatically drive soil samplers with an exact 30-in. free fall hammer blow; and core drill down to 500 ft. The versatile rig is trailer mounted and includes a 6-ft hydraulic feed rotary unit, a four-speed hoist, an integral 19-ft derrick, and a built-in automatic driving mechanism. For all drilling operations, the unit is driven through a sliding gear transmission with four speeds forward and one in reverse. The power unit is a four-cylinder gasoline engine that develops 38-hp at 2600-rpm. For augering, a hydraulic thrust rotary unit with a six-ft stroke allows augers up to 5-ft in length to be used. Hole diameter can be up to 6¼-in. with a 5½-in. auger. With the hydraulic thrust rotary unit pivoted off the hole, the Testborer is ready to automatically drive spoon samples and casing or pipe. The driver arm is cam actuated and it mechanically lifts the drive hammer and allows it to free fall an exact 30 in. The range is from 11 to 80 hammer blows per min. For core drilling, the six-ft stroke of the rotary unit allows a five foot run without the need for rechucking. — **Penndrill Mfg. Div., Pennsylvania Drilling Co., 1205 Chartiers Ave., Pittsburgh 20, Pa.**



SMALL CRAWLER—Oliver is now in production with its OC-4 crawler tractor, a 22-dbhp unit with the ability to handle a variety of front and rear-mounted attachments. Its small size makes it ideally suited for close-quarter work. Among the features of the OC-4 are a new four-speed transmission with a range of from 1.56 mph in first to 5.26 mph in fourth; a new heavy-duty clutch, and a low silhouette that assures full operator visibility. The crawler has four lower track wheels, which provide better than average ground contact for a crawler of this size. The main frame incorporates deep channel rolled steel that is heavily reinforced to withstand severe strain. Construction of the main frame and the track frames eliminates the conventional cross braces and adds to the under-clearance of the unit. The crawler is powered by a four-cylinder gasoline engine that delivers 22 dbhp. Available attachments include a dozer, angle-blade, and such standard three-point hitch attachments as a scraper, scarifier, winch, and other special-purpose tools. — **Oliver Corp., 400 W. Madison St., Chicago 6, Ill.**

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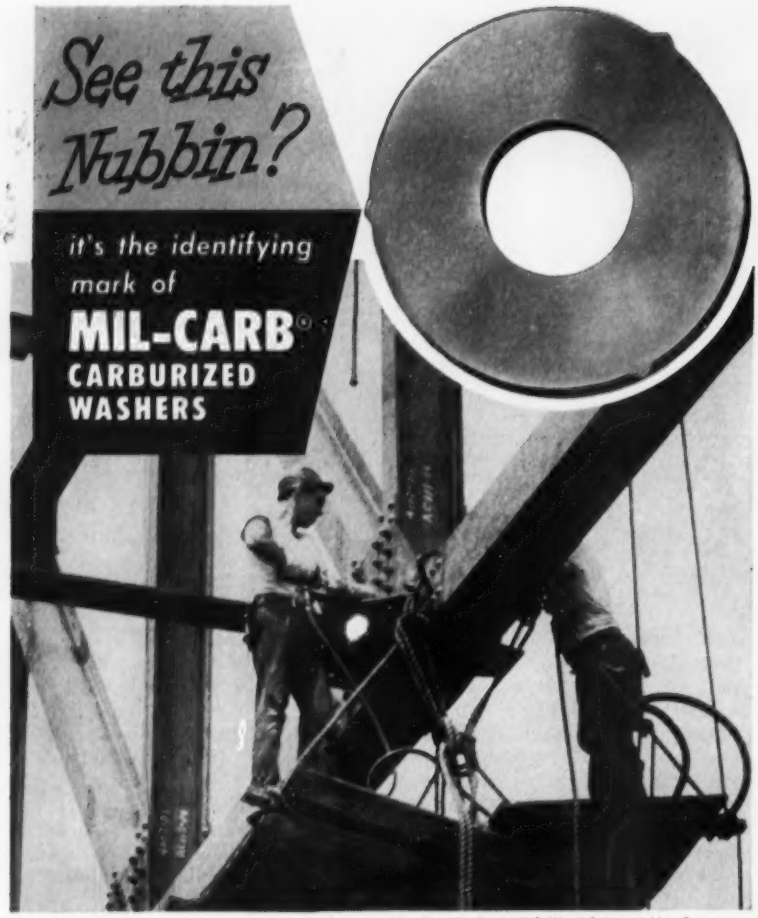


Photo courtesy Russell, Burdsall & Ward Bolt and Nut Co.

From an appearance standpoint, all washers, regardless of brands, practically look alike. But, *there's a big difference in quality!* That's why, for easy identification and to insure your getting the very best, Mil-Carb Carburized Washers are identified by 3 "nubbins" on the outside rim.

Mil-Carb washers are outstanding on at least three counts:

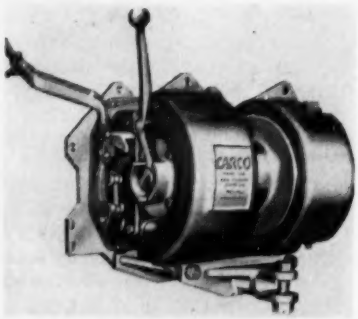
1. **Only Prime Quality Special Soundness Steel is used for strength equalling or exceeding the rigid specifications of ASTM designation A-325 *at all times!***
2. **A special treating process provides an exceptionally hard "outer skin" to resist grinding by the nut under the impact wrench *when others fail!***
3. **MIL-CARB washers are always uniformly flat and smooth with dimensions conforming to the American Standards Association.**

For your own protection and as a guarantee of the unyielding permanence of your steel structure . . . "look for the nubbin" . . . specify MIL-CARB Carburized Washers. Available in six sizes, from ⅝" to 1⅜", packed in 200 lb. kegs.

Distributed by Leading Bolt and Nut Manufacturers and

U. S. STEEL SUPPLY DIVISION
UNITED STATES STEEL CORPORATION
208 South La Salle St. • Chicago 4, Illinois

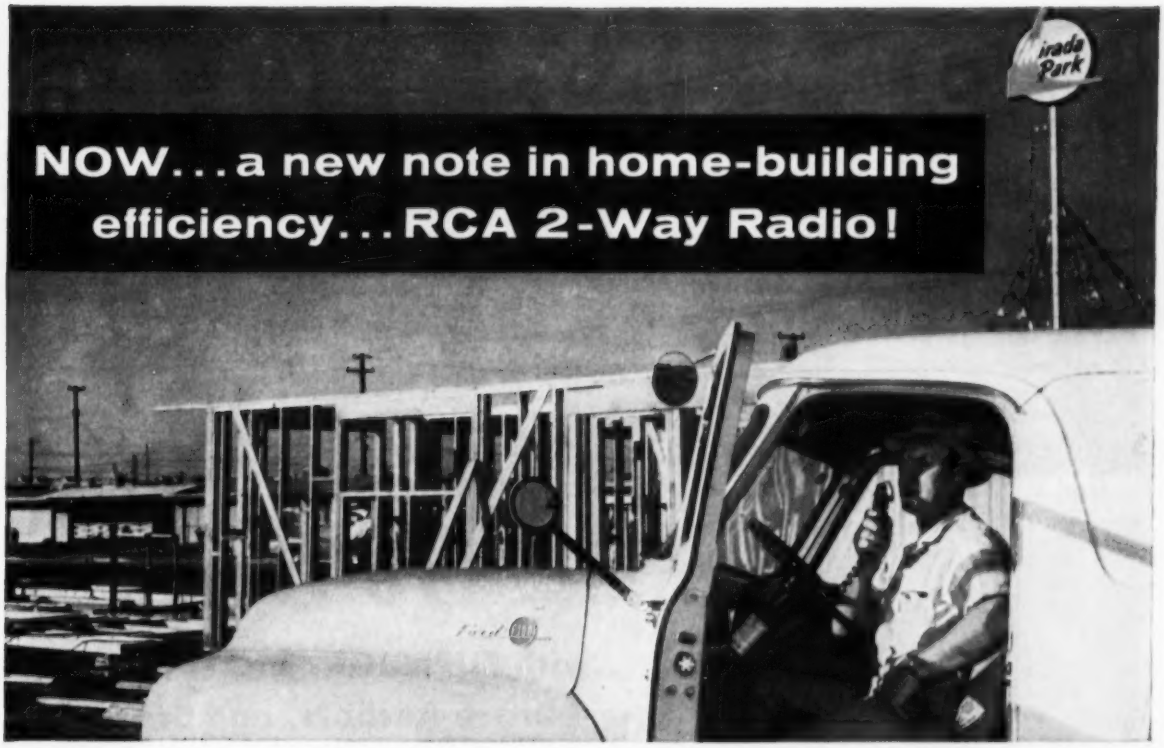
WROUGHT WASHER MANUFACTURING CO.
The World's Largest Producer of Washers
2247 S. BAY ST., MILWAUKEE 7, WIS.



SMALL TRACTOR WINCH—A new Carco winch, the model C-3, will provide the small tractor with the extra pulling power needed to handle a wider variety of towing, hoisting, and skidding jobs. The winch matches the performance of the John Deere 420, International 300, Oliver OC-3 and OC-4, and Terratrac 200, 300, 400, 500 tractors. The winch produces a line pull of up to 10,000 lb, which is virtually double the drawbar pull of the matching tractors. Its features include a constant-mesh gear train for positive starting pull and less slippage; extra large brakes; an effective release system that gives the operator control of the load at all times. The drum rolls free on anti-friction bearings when the clutch is disengaged.—**Carco Sales Dept., Pacific Car and Foundry Co., Renton, Wash.**

45-TON TRUCK CRANE—Koehring's new 45-ton capacity truck crane weighs only 90,080 lb ready to work, and for traveling this can be reduced to 67,100 lb by removing the boom, counterweight and outrigger beams. Called the model 445, the truck crane can handle up to a 120 ft of boom, according to the manufacturer. Straight boom jibs of 15, 20, 25, and 30-ft lengths with cable are available for special high lift crane service. Safety boom limit stops and power boom

NOW... a new note in home-building efficiency... RCA 2-Way Radio!



Mobile radio installation plays sweet music for Beverly Hills Construction firm!

The two-way radios installed in the maintenance vehicles, sales and other executive cars of the Larwin Company—top rated builders of homes in Southern California—transmit talk, not music! But, it pays off in sweet profits . . . by keeping them in touch with project sites often several miles apart. Communications costs have been cut by $500 per month, to mention one big saving.

Other advantages are reported by three key officials . . . Sidney Cagan, Sales Manager, notes a 100% increase in efficiency in his operation, faster escrow clearances, extra good service to customers. Purchasing Agent B. M. Moore says it speeds up completion work by keeping superintendents informed of delivery schedules. With more than 1000 homes in 5 different tracts, the maintenance crew under Ed Meibos saves thousands of dollars annually for the company by getting the jump on sudden repairs and storms, eliminating needless trips. In real emergencies, such as accidents to workmen, the radio proves invaluable in getting medical attention without delay.

The Larwin Company is enthusiastic about two-way radio and, as a builder of fine homes, Larry and Bill Weinberg's successful firm has understandably standardized on the finest in radio . . . RCA.

Larwin Company installation consists of RCA Citizens Band Radio, Carfone-450. Four 15-watt base stations, 2 remote control units; 6 15-watt mobile units. Use coupon below for additional information about RCA 2-Way Radio for construction applications.

Mark of RCA Quality

Tmk(s) ®

RADIO CORPORATION of AMERICA

COMMUNICATIONS PRODUCTS

CAMDEN, N. J.

In Canada: RCA VICTOR Company Limited, Montreal

Radio Corporation of America
Communications Products
Dept. R-203, Building 15-1, Camden, N.J.

☐ Please send me complete information on RCA 2-Way Radio use in the construction business.

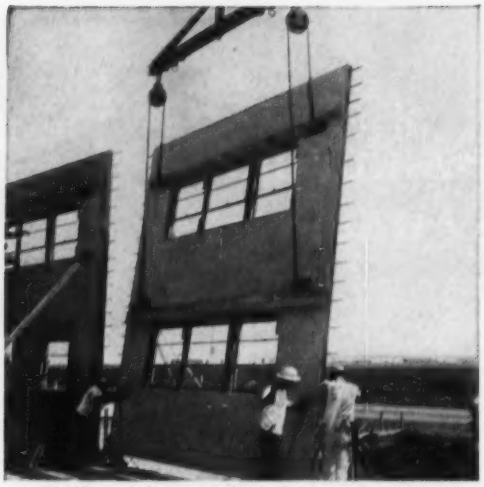
☐ Have RCA Communications specialist make a FREE radio survey of my operation.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____



PANEL with large window areas

WAREHOUSE

DANIEL CONSTRUCTION CO. PHOTO

Tilt-Up Costs Go Down

...with SUPERIOR "Pick-Up" Inserts, Brace Anchors, and Braces

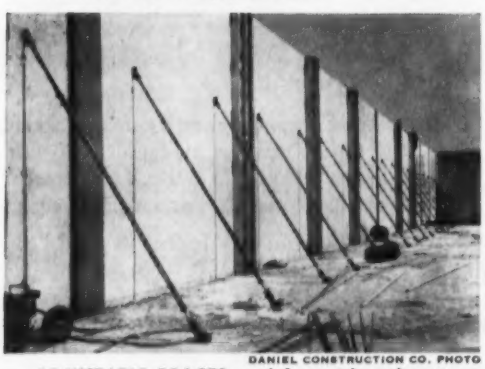
When an outstanding Tilt-Up job rates an article in a construction publication you can be almost certain that SUPERIOR products were used. The reason is simple. SUPERIOR, as the pioneer in this field, developed designs that were thoroughly tested both in the laboratory and the field to assure safety with economical prices and low application costs.

These "Pick-Up" Inserts, Brace Anchors, and Adjustable Braces have been used and proven on literally thousands of projects, not a few of which were unique in design. With a background of such experience, the recommendation of our engineers as to location and types of Inserts and Anchors is reliable and valuable.

Avoid expensive crane delays, be assured of safety, and reduce your overall costs with these SUPERIOR products.

For further details request a copy of Bulletin TU-3

57 TON SLAB being positioned



DANIEL CONSTRUCTION CO. PHOTO

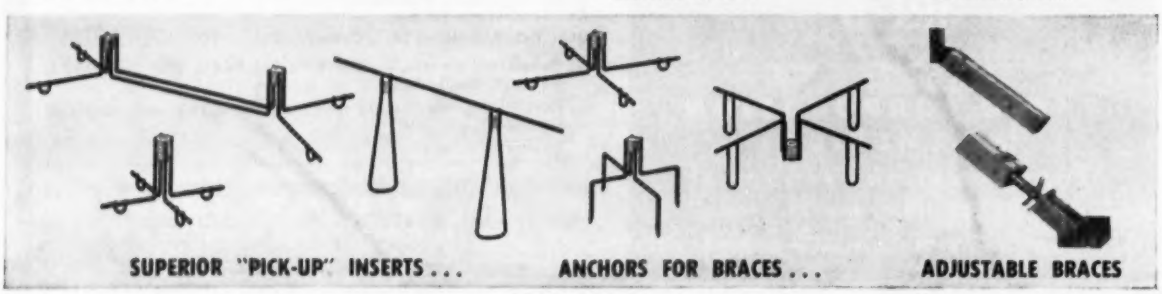
ADJUSTABLE BRACES used for quick and easy alignment of panels

SUPERIOR
CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (Suburb of Chicago)

New York Office
1775 Broadway
New York 19, N. Y.

Pacific Coast Plant
2100 Williams St.
San Leandro, Calif.



SUPERIOR "PICK-UP" INSERTS . . . **ANCHORS FOR BRACES . . .** **ADJUSTABLE BRACES**

lowering are standard. The truck is powered by a Waukesha engine that delivers 214-hp at 2400-rpm. Top speed is 31.8-mph. The truck chassis, mounted on a 220-in. wheel base, is 10 ft 1 in. wide, 30 ft 2½-in. long.—**Koehring Co., Milwaukee 16, Wis.**

300-AMP HOLDER — The new Tong-Grip electrode holder, which delivers 300 amps on a heavy duty cycle when connected to a 00 cable, has been introduced by Martin Wells, Inc. Weighing only 17 oz., it features all-glass insulators and springs, a patented slip-on insulator with no screws or rivets, and a patented wedge cable connector that makes a permanent connection on first installation. The holder, which has only nine parts, can be assembled or disassembled in only a few minutes without tools.—**Martin Wells, Inc., 5886 Compton Ave., Los Angeles, Cal.**

GERMAN TRACTORS—With U.S. headquarters in Bridgeport, Conn., Porsche-Diesel of America, Inc., will import a line of small wheel tractors made by the famous German motor works. The Porsche-Diesel engine offers the advantages of air cooling together with economy of operation and low maintenance requirements. The initial imports also feature an oil-operated hydraulic clutch, four or five forward and reverse gears plus a crawling gear, and hydraulic power lift. The cooling system on the diesel engines is supplied with a constant air flow that can be regulated at will. A warning horn sounds whenever the temperature exceeds the maximum permissible. The 33-hp model P-133, above, is

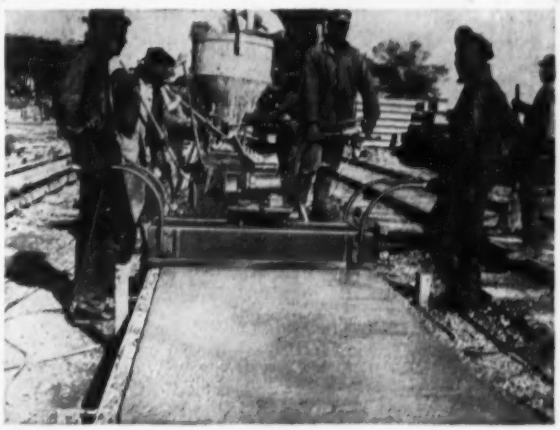
STOW DEVELOPS TWO NEW PRODUCTS FOR PRECAST WORK

POWER MIDGET VIBRATOR

The manufacturers of precast concrete products have long needed a vibrator head "to work in the narrow forms we use" . . . a head about 1¼" in diameter. For a long time it was thought improbable that a head *this* small could really do any work.

Now, Stow Manufacturing Co. has developed a vibrator with a 1¼" head that really packs a wallop. It is powered by a ½ HP universal motor, with trigger switch, which drives the head at 12,000 VPM. Thoroughly field tested, the Power Midget is ideal for precast work, perfect for any job where narrow forms are required (bank vaults, manholes, etc.).

TWIN BEAM VIBRATING SCREED



In addition to the Power Midget Vibrator, Stow Manufacturing Co. has developed and thoroughly tested this revolutionary machine for striking off thin precast slabs; a vibrating screed with *two* beams. *Working with this Twin Beam Screed gives the effect of making two passes at once.* The vibrating head transmits the vibration evenly to both beams. Thus as the screed is worked along, the first beam strikes off the concrete, while the second beam gives the concrete a final finish! For more information on the Power Midget Vibrator, or the Twin Beam Screed, contact your Stow Distributor. In most cities, you'll find him listed under "Concrete Vibrators" in the yellow section of your telephone directory. Or, if you prefer, send in the coupon below.

For complete information on Vibrators, Screeds, Roto-Trowels, Concrete Grinders, write for Stow Catalog 560.

STOW MANUFACTURING CO., 31 Shear Street, Binghamton, N. Y.

Please send me literature and specifications on the Stow Power Midget Vibrator and the Twin Beam Screed.

NAME_____

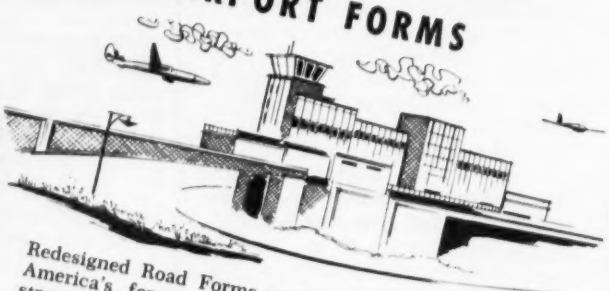
COMPANY_____

STREET_____

CITY_____ STATE_____

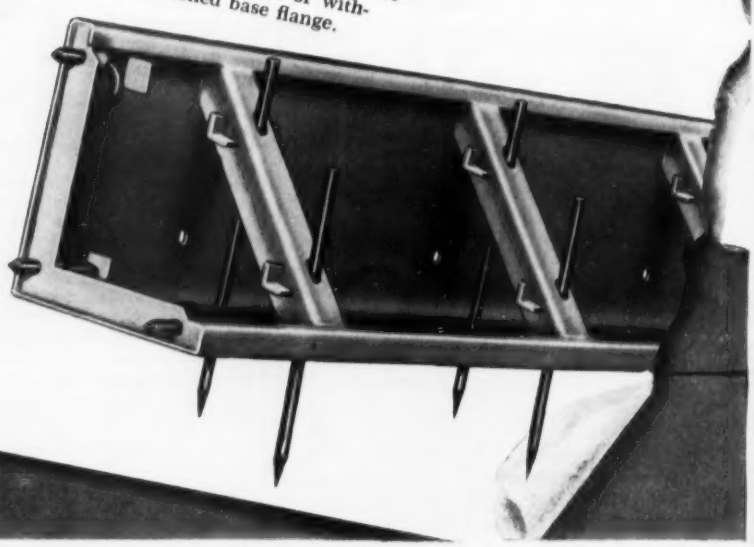
Here's the greatest Steel ....ever offered!!

HIGHWAY AND AIRPORT FORMS



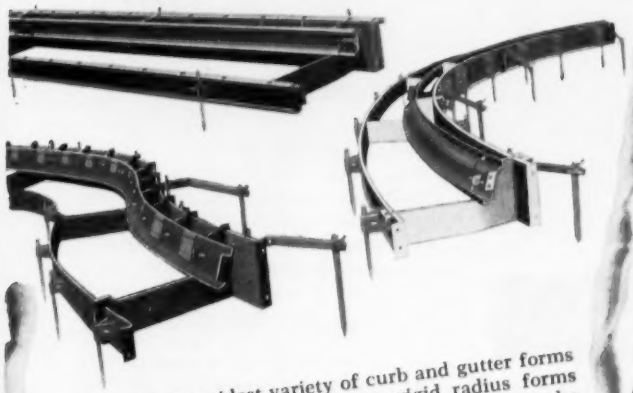
Redesigned Road Forms engineered by America's foremost form builder, are stronger, easier to align, faster setting than ever before. Built to contractors specifications, these new forms will take plenty of punishment and give years of service. They are now available with or without upturned base flange.

Heltzel's husky Dual Duty Forms have long been the favorites of contractors who build airport runways and ramps. These forms come in a number of double faces to enable contractors to pour two slab thicknesses with the same form.



Form Value

CURB AND GUTTER FORMS



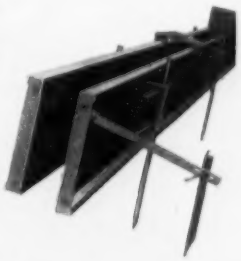
Heltzel builds the widest variety of curb and gutter forms in the industry. Straight, flexible or rigid radius forms for any face and style. You'll want to know about the combined curb and gutter forms with the interchangeable sections that permit many styles from the same basic set . . . a real cost saver!

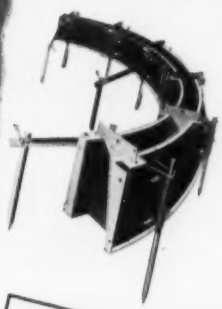
SIDEWALK FORMS

Here's an improved design sidewalk form with built-in Heltzel quality that assures lifetime performance. Division plate slots are spaced in one foot increments for better pouring practice.

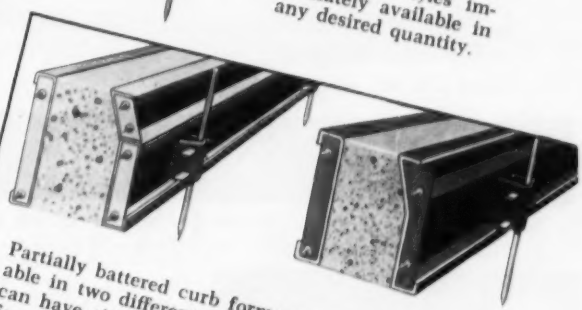
CURB FORMS

Heltzel Curb Forms now have full length stake pockets that add to form rigidity—make staking faster, more positive. Forms are made of prime steels



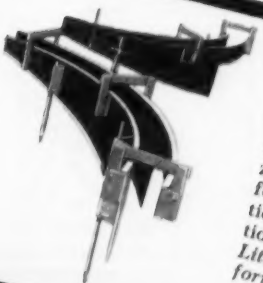


that have rerolled rail stakes. Battered or straight face in straight, fixed or flexible radius styles immediately available in any desired quantity.



Partially battered curb forms are available in two different types. Contractors can have either the single or two piece form. Both have the strength and ruggedness that is typical of Heltzel Steel Forms.

Adjacent forms for adding curbing to slabs already in are available in the widest variety of combinations.



SPECIAL FORMS

Whatsoever your forming needs it pays to specify Heltzel Forms. Heltzel will build forms to meet any specifications — for islands, foundations, driveways, piling, etc. *Literature available on all form types and styles.*

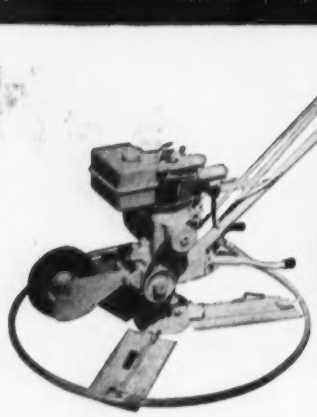
247

HELTZEL STEEL FORMS

THE HELTZEL STEEL FORM AND IRON CO., 404 THOMAS RD., WARREN, OHIO

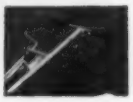
INTERCHANGEABLE BLADES ON THE

White TROWELER



Retractable wheel, up to trowel, down to move.

Remove blade and ring in *seconds* . . . for cleaning, changing blades, or moving through doorways.



Adjust blade pitch *during* rotation from handle. Safety throttle control stops rotation if operator lets go handle.

PORTABILITY, patented exclusive! PERFORMANCE, unbeatable! PRICE, comparable to trowelers *without* these features! Model T-1, 36″ diameter, Patent No. 2,621,568.

White MANUFACTURING COMPANY

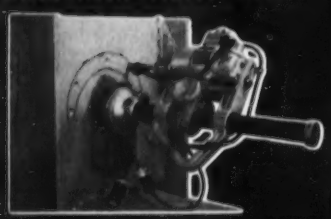
Elkhart 6, Indiana (Write for folder on all models.)

ONLY

MAG-TOOL

HAS

MICROMATIC ADJUSTMENT



MAG-TOOL Drill Presses attach magnetically to ferrous surfaces bringing the capacity of heavy duty presses right to the job!

MICROMATIC ADJUSTMENT enables movement of the drill for precise positioning *after* the press has been attached to the working surface. For example, (see photo) the bit may be easily positioned anywhere between the two curved lines without moving the drill press.
Inquiries invited.

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TOOL CORPORATION
1955 Lafayette St. Santa Clara, Calif.

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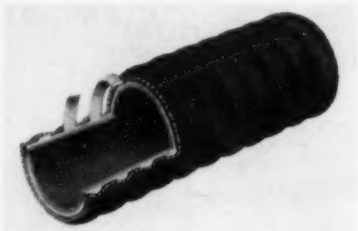
EQUIPMENT NEWS . . . continued

a three-cylinder tractor with a 5½-ft wheelbase. It weighs 4,630 lb as standard, but the weight of the tractor can be increased by 40%. Other tractors in the line include 44, 22, and 12-hp models. Prices in the U.S. will range from $1,650 to $4,000.—**Porsche-Diesel of America, Inc., 39 Sylvan Ave., Bridgeport, Conn.**



RUGGED HOSE—A new crush-proof, smooth-bore suction hose—which has a springy Stycon synthetic rubber cord instead of wire—is now available. The Stycon cord is embedded in rubber between multiple plies of hose duck. It is said to snap back automatically when flattened by a truck, falling rock, or the contractor's equipment. The hose is corrugated to give it greater flexing power. Called Vitalis 368, the new hose is available in 1½, 2, 2½, and 3-in. sizes in lengths up to 50 ft.—**Continental Rubber Works, 2012 Liberty St., Erie 6, Pa.**

POST AND RAIL DIGGER—Roper's new Highway Digger digs quickly down to the 48-in. depth required for setting post and guard rails. It mounts easily on a small utility tractor and can be removed quickly. Standard equipment includes a slip-clutch universal joint, ⅜-in. spiral flighting with hardened edges; and a hardened fishtail point for fast penetration. Augers up to 14-in. dia are available. The unit is guaranteed for one yr, and the power gears are guaranteed for 10 yr.—**Roper Mfg. Co., Zanesville, Ohio.**

B-60 SERIES—All-around workhorses for construction jobs everywhere. B-60 four- and six-wheel chassis are available for dumpers, concrete mixers, equipment hauling tractors, and flat-bed trucks . . . powered with Mack Thermodyne® gasoline or diesel engines in the 170 or 205 horsepower range.

B-80 SERIES—Largest and most powerful highway and off-highway chassis in the Mack line. B-80 tractors for heavy carry-all trailers and B-80 truck chassis for mixers and dumpers are available in four- or six-wheel models . . . powered with 170 to 205 hp Mack Thermodyne gasoline or diesel engines, or stock diesels in the 250 to 300 horsepower class.

B-40 SERIES—Widely popular for maneuverability and rugged strength. B-40 four- or six-wheel dumpers, mixers, flat-bed trucks and tractors are especially valued for their bonus capacities, economy, and handling ease. Powered by Mack 150 hp Thermodyne diesel or Magnadyne gasoline engines.

Most in demand . . . for the most demanding jobs

For dump, mixer, or flat-bed truck service in highway and off-highway hauling, Mack large-capacity trucks and tractors will do your toughest, most demanding jobs more efficiently, more economically, and more profitably. More, Mack offers you the widest selection of heavy-duty units with gross vehicle weights ranging from 25,000 to 65,000 lbs. and tractors for carry-all trailer service up to 175,000 lbs. G.C.W.

Have your local Mack representative give you complete details and specifications. Mack Trucks, Inc., Plainfield, New Jersey.
In Canada: Mack Trucks of Canada, Ltd.

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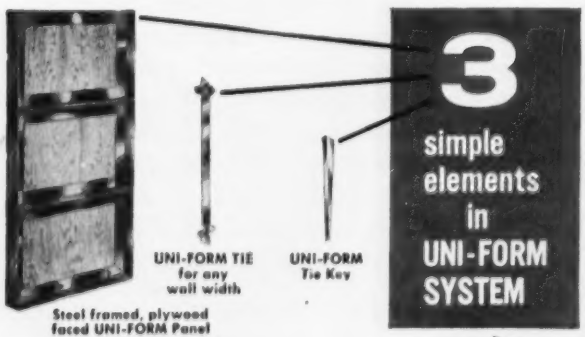
4839

reduce forming costs...

with UNI-FORM PANELS

Whether you're bidding on a sewage treatment plant, industrial building, highway bridges, overpasses or abutments, heavy foundations, circular tanks or a warehouse, UNI-FORM Panels will give you the lowest all around forming costs.

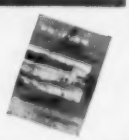
Why? UNI-FORM Panels can be erected faster, using less labor and material because the three basic elements of the UNI-FORM System—Panel, Tie and Tie Key provide simple mechanical assembly into any type of form. Unique system of attaching the minimum aligning lumber required reduces labor by 50% . . . pre-engineered techniques for handling pilasters, corners, stepped footings, columns, battered walls assure fast job progress.



Steel framed, plywood faced UNI-FORM Panel

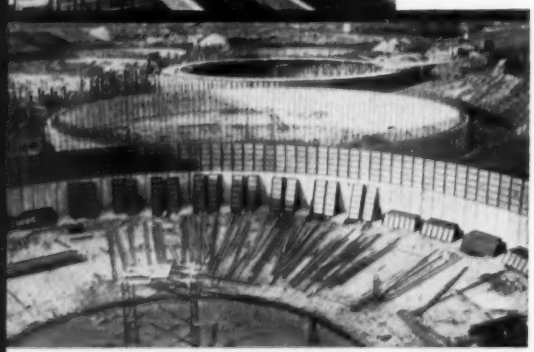
3 simple elements in UNI-FORM SYSTEM

INTERESTED? **Get the catalog and complete details on the UNI-FORM System today. Send us a set of plans for our recommendations. You will be money ahead, and there's no obligation.**

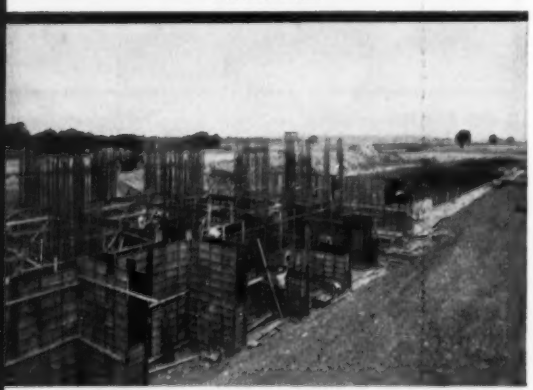


Sewage Treatment Plant "Y" Walls

Slabs



Circular Walls



Heavy Industrial Foundations

P1500

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Lockhaven 2-2051	Redwood 2-8900	Axminster 2-0231	Dickens 2-0240	Capital 7-9204	TRinity 6-8126
Enterprise 1-0132					

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

ASPHALT PLANT COMPONENTS—The Littleford Trail-O-Dryer, which heats and drys sand and aggregate for bituminous mixers, and the Littleford model 5T25 Dual-Feeder bin, which feeds the Trail-O-Dryer, are described in a new bulletin. The two new Littleford units are designed as integrated components to work with Littleford's Trail-O-Patcher, which distributes the material. In effect, this set-up offers a small asphalt plant without the complications of bigger plants.—**Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, Ohio.**

AGGREGATE PLANTS — Iowa Mfg. Co.'s portable aggregate plants are diagrammed in a new bulletin that shows how they can be set up in various combinations to produce crushed and screened aggregate to any specification requirement. A double-page gatefold devotes a page each to the different types of primary, intermediate, scalping, and secondary crushers and screening and bin units.—**Iowa Mfg. Co., Cedar Rapids, Iowa.**

CURING PROCEDURES—"Curing and Protecting Concrete Highways" is the title of a new booklet offered by American Sisalkraft Corp. The booklet explains the value of proper concrete curing and shows the results of tests when various curing materials are used. On-the-job photographs show the Sisalkraft curing method, which uses white paper blankets to cover the concrete surface.—**American Sisalkraft Corp., Attleboro, Mass.**

LARGEST INTERNATIONAL — IH has just made available an 8-p., two-color bulletin on the 200-hp TD-24, largest crawler in the IH line. Called "Boss of the Big Jobs," the pamphlet describes the framework, and the power steering system, and discusses the values of torque converter or main gear drive transmissions. Line drawings illustrate components of the torque converter drive system and the frame, and a cutaway exposure

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Albert Elia, Niagara Falls, N.Y., General Contractor, reports, "We saved approximately $300 in one day by transporting this 25-ton load of 60' joists for a new school building, on our 27-ton capacity LaCrosse DF6T trailer. We made the move in one trip, whereas two trips would have been required by local trucking firms, if the job was sub-let."

This is a good illustration of how you, too, can save time and money by having the right size LaCrosse trailer on hand when you need it. With your own trailer, you can practically *double the efficiency of your present equipment and work-crews* . . . do a better job of scheduling . . . avoid costly down-time, by rushing "crippled" equipment into repair shops with minimum delay.

With LaCrosse, you *save up to 2000 lbs.* of useless deadweight per trailer . . . have a wide choice of models, from 6 to 75 tons capacity, with single or multiple axles, integral or removable goosenecks. LaCrosse Trailer Corp., LaCrosse, Wis., U.S.A.

LC-42

New front-loading LaCrosse Model LXP is ideal for hauling blacktop pavers behind any type of truck. Trailer has self-contained power-system, with sheave-type hitch, cable-lift, 7" loading-height. 8 or 14-ton capacity.

LaCrosse tilt-trailers speed loading and unloading of tractor-shovels, rollers, etc. Choice of four drawbar and gooseneck models — from 6 to 22-ton capacity — with single or tandem axles, hydraulic "cushion-tilt".

Heavy metal fabrication since 1865

MOBILIZE YOUR EQUIPMENT FLEET NOW!

LaCROSSE

VALUE LEADER IN LOW-BED TRAILERS

NEW PUBLICATIONS . . .
continued

explains the steering system. Diagrams illustrate steering clutch positions when the operator desires to make gradual, feathered or pivot turns. — **International Harvester Co., Construction Equipment Div., 180 N. Michigan Ave., Chicago, Ill.**

WIRE ROPE—A comparison table on the relative breaking strengths of various types of wire rope is included in a new folder recently prepared by Jones & Laughlin Steel Corp. The folder includes recommendations for using J&L's CenterFit wire rope on various types of earthmoving equipment. **—CenterFit, Wire Rope Div., Jones & Laughlin Steel Corp., Muncy, Penn.**

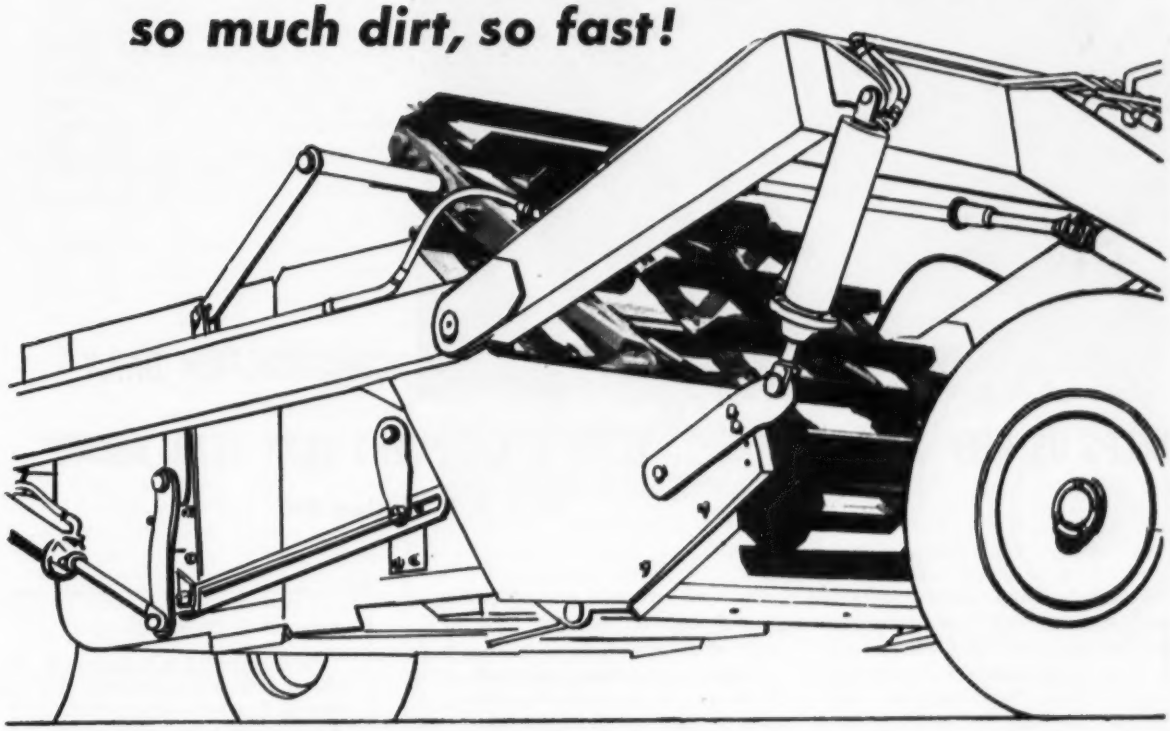
TECHNICAL ANSWERS—Gulf's new cost-free service program, which is designed to provide practical assistance to users of fuels, lubricants, and other petroleum products, is described in a new 24-p illustrated booklet. Gulf claims its "petro-engineering" service is valuable to users for two reasons: Gulf engineers can provide the highly technical knowledge needed to specify the right product for the right application; highly trained engineering personnel are in a position to utilize the enormous advances in petroleum science in recent years. The company program is accessible to industrial and commercial users of petroleum products through 99 district and eight division offices throughout the country.**—Gulf Oil Corp., 1822 Gulf Building, Pittsburgh 30, Pa.**

METAL LATH SPECS—The 1957 edition of "Specifications for Metal Lathing and Furring" is now ready for free distribution by the Metal Lath Manufacturers Association. The 20-p booklet covers specifications for solid and hollow partitions, wall furring, metal lath attached to wood supports, beam and column protection for fireproofing, and reinforcing methods. **—Metal Lath Manufacturers Association, Engineers Building, Cleveland 14, Ohio.**

ROLLER LINE—Buffalo-Springfield, a division of the Koehring Co., has released a new illustrated 12-p bulletin that covers its entire line of road rollers and compaction equipment. Two and three-axle tandem rollers, three-wheel vari-

because of **Hancock's** *elevator,*

No other Scraper can move so much dirt, so fast!



Yet the HANCOCK Elevating Scraper costs much less * than other Scrapers of equal capacity!

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200 YARDS...

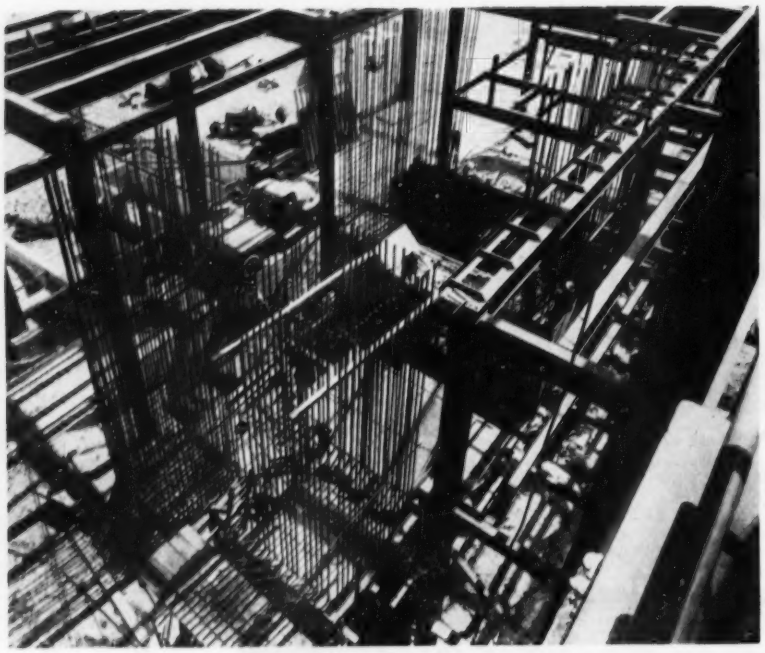
IN ONE HOUR

With the elevator continually removing the dirt from around the cutting blade and distributing it evenly throughout the scraper, you get a balanced load at all times. This results in faster cutting, fast load transportation, maneuverability, and low power requirement. None of the blades' cutting capacity is sacrificed to push the dirt back into the scraper. The Hancock 11 yard Elevating Scraper is hydraulically controlled, works efficiently with any tractor of 75 horsepower or over and turns in only 28 feet.

*Less than ½ the cost of some models.

HANCOCK

Write, wire, or phone HANCOCK MANUFACTURING COMPANY, — PORTER 3-8297 LUBBOCK, TEXAS



• W. B. Tuttle Plant, Unit #2 — 100,000 kw power plant for City Public Service Board of San Antonio is one of **H. B. Zachry's** latest projects. It is part of approximately $25,000,000 worth of work completed by Zachry in 1956.

"CONSTRUCTION DAILY HELPS US KEEP 2000 MEN, 1500 PIECES OF EQUIPMENT BUSY YEAR-ROUND",

Says H. B. Zachry Co.

"We complete approximately $100,000 worth of construction each working day," says J. D. Lang, Assistant to the President of H. B. Zachry Co., general contractors of San Antonio, Texas. "To maintain this level of operation, and keep our 1500 pieces of major equipment and 2000 men busy, we have to be continually on the lookout for major new contracts. Construction Daily is our best source of advance information on new work of sizeable proportions."

"The Daily Reports and Newsletter are received by airmail. They are routed first to Mr. H. S. Kerr, Vice President. He studies them and notes any jobs that we may be interested in bidding. He then may discuss these with our president. They also discuss any significant trends in materials, equipment or labor prices, and any noteworthy changes in business conditions reported in the Newsletter. It is then referred to me for general business background and, in particular, for announcements of any new developments in the planning stage," reports Mr. Lang. "We also use the Daily for economic indicators for future planning purposes. Price report information on significant changes in lumber, cement and reinforcing steel are brought to the attention of our estimators."

The Construction Daily can help you build business, too. Published every working day of the year, it includes two separate publications — the Daily Newsletter and the Construction Reports. The Newsletter is two quick pages of highspot news, newly announced bid dates, proposed new work reports, price information, economic news, reports from Washington and other fast-breaking news that keeps you a step ahead of your industry. The Reports section includes bids asked, low bids, and contract awards on more than $80,000,000 worth of business every day. It is the fastest, most complete system of reports on heavy construction in the country.

Construction Daily can arrive on your desk every morning, delivered air mail west of the Mississippi, giving you a big jump on new business and changes in business conditions that will pay off in new contracts, and time and money saved on current projects. A full year's subscription to this specialized news service costs only $175. Quarterly subscriptions are available for $50 for three months. Write now for complete details.

About H. B. Zachry Co. . . .

Founded in 1925, H. B. Zachry Co. started business as a highway contracting firm exclusively. Gradually they expanded into small commercial and public structures until 1938 when a large natural gasoline plant contract marked its entry into the major industrial field.

The war years were marked with explosive growth, with the firm building airfields, cantonments, and other military facilities in Texas. After the war the company expanded into construction of pipelines, petro-chemical plants, power plants, railroads and dams. Sixteen wholly-owned subsidiaries and affiliated companies have been created in fields ranging from insurance and mortgage companies to contract flight training, aircraft distributorships and aircraft refueling.

In 1940, Mr. Zachry, the founder, served as national president of the Associated General Contractors of America.

Construction Daily Dept. CM&E-100, 330 West 42nd Street New York 36, N. Y.
A McGRAW-HILL PUBLICATION

NEW PUBLICATIONS . . .
continued

able weight rollers, and the popular K-45 Kompactor are among the units described. The K-45 Kompactor is a self-propelled, highly maneuverable machine with working speeds of up to 5 mph in either direction. On-the-job photos show it working in such tight spots as inside buildings and next to culverts. The Kompactor has four roller wheels faced with staggered rows of heavy steel pads that form the compacting surfaces.—**Buffalo-Springfield Roller Co., Springfield, Ohio.**

CUMMINS FUEL SYSTEM—A new 12-p booklet answers many questions concerning the design and operation of the popular Cummins PT fuel system. The four-color booklet has cutaway views of the four PT fuel pump assemblies and it also shows the PT injector. The diagrams are designed to give the reader an understanding of the inner workings of the diesel fuel system. A section of the booklet gives data on optional governor arrangements. The PT fuel system is adaptable to all Cummins diesels built since 1932.—**Cummins Engine Co., Inc., Columbus, Ind.**

BURMEISTER MIXERS—The line of Burmeister Tilt-Up mixers is described in a new catalog. Available in sizes ranging from 1 to 7½-yd, the concrete mixers feature simple automatic control of the powerful hydraulic tilting action through electric push buttons. Other parts of the units described in the catalog include the blade design, split drum, ring gear, and the main and edge rollers. Complete specifications for each unit are provided in the catalog, which also lists all optional equipment.—**L. Burmeister Co., 4535 W. Mitchell St., Milwaukee 14, Wis.**

ROPE SLINGS—Three new folders describing suggested applications and ordering specifications for wire rope slings have been issued by the Wickwire Spencer Steel Div. of the Colorado Fuel and Iron Corp. The folders describe Wickwire's Uniflex, Multiflex, and Maxiflex wire rope slings. Each folder describes specific jobs for which each sling is best suited. Typical applications are illustrated —**Colorado Fuel and Iron Corp., 575 Madison Ave., New York, N.Y.**

continued on next page

Is Equipment Cleaning COSTING YOU TOO MUCH?

Bark River Culvert & Equip. Co., Eau Claire, Wis., cleans equipment and parts with Malsbary 250, finds it delivers much more volume than steam vapor cleaner formerly used.

Here's a chart based on actual time studies from competitive demonstrations of steam vapor cleaners vs. Malsbary HPC (high pressure combination) cleaners. Note the time and dollar savings you can make with HPC.

CLEANING JOB	STEAM VAPOR CLEANER	MALSBARY HPC CLEANER
A-C HD-20 complete, ready to paint	Size: 120 gph. max. 5½ hrs. $12.30	Model 250 2¼ hrs. $7.53
3500 Manitowoc complete, inside and out	Size: 120 gph. max. 40 hrs. $98.40	Model 250 10½ hrs. $35.18
Model HH Payloader	Size: 120 gph. max. 3 hrs. $7.38	Model 250 1½ hrs. $5.03
International TD-24	Size: 180 gph. max. 6 hrs. $17.40	Model 250 2 hrs. 35 min. $9.65

Note: Costs include labor, fuel, cleaning compound, electricity, water, and hose depreciation.

Why HPC Cleans So Much Faster — Malsbary (and only Malsbary) HPC cleaners deliver 240-480 gph. of 325° F. solution at 300-400 psi. This combination of volume and pressure plus solution 100° hotter than any other cleaner, makes the difference. It literally explodes hot solution from the nozzle, softens and blasts away stubborn tars, corrosive grease and dried muck on a time schedule other cleaners can't touch.

Malsbary HPC cleaners also supply wet steam for degassing tanks and for heating use; hot water for removing ice and frozen mud; cold water at 300-400 psi. for rapid removal of dirt and mud where no chemical or heat is needed; warm water for washing and rinsing equipment.

Make this side-by-side test — If you're now using or considering a steam vapor cleaner, ask your Malsbary dealer for a side-by-side competitive demonstration. Let each cleaner do one half of the same rig. You'll quickly see why HPC cleans so much better and faster. Try it—call your Malsbary dealer NOW (see yellow pages of phone directory) . . . or write us.

105

MALSBARY SINCE 1921 MANUFACTURING CO.

Room C4, 845 92nd Ave., Oakland 3, Calif.

LUBRIPLATE No. 630-AA LUBRICATES ABOUT EVERYTHING

LUBRIPLATE No. 630-AA is practically a universal grease type lubricant. It was developed to meet industries' need for *"simplified lubrication"* . . . one lubricant to effectively satisfy a great number of requirements. LUBRIPLATE No. 630-AA has a smooth, stable consistency, a wide temperature range, possesses high film strength, fine adhesive properties and is water repellent. It satisfies most lubrication requirements, thus eliminates the need for a different lubricant for each application in many cases.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK". . . a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

NEW PUBLICATIONS . . .

continued

GAR WOOD CATALOG—A new 12-p catalog describes and illustrates Gar Wood's line of medium duty dump bodies and hoists. The catalog lists typical applications for the bodies in the Gar Wood line, and also gives information on arm-type and direct lift hoists, as well as the popular conversion hoists. Specifications for hoists with capacities ranging from 6 to 12 tons are provided.—**Gar Wood Industries, Wayne, Mich.**

SAFETY KITS—Valuable first aid advice, as well as detailed information on unitized first aid kits, are included in a new general catalog issued by Medical Supply Co. The 32-p booklet provides information ranging from proper snake bite treatment to a chart showing correct kits and supplies to handle emergencies in various industries. The catalog covers such medicants as bandages and compresses, eye dressings, antiseptic swabs and applicators, poison ivy treatments, and salt tablets.—**Medical Supply Co., Rockford, Ill.**

BLACK TOPPERS—A new six-page catalog describes the model MX Etnyre Black-Topper distributors for heating and applying asphalt, tar, emulsion or road oil. The catalog gives details and specifications and lists auxiliary equipment for the three styles available. These are rear engined drive, front engine drive, and semi-trailer models. Standard tank capacity, weights, mounting data charts and other important specifications also are included.—**E. D. Etnyre & Co., Oregon, Ill.**

BLASTING DATA—A new brochure outlines current information on drilling, blasting and excavating methods used by construction crews. Entitled "Construction Case Histories," the bulletin unfolds into a three-page chart that presents 48 detailed construction case studies in condensed data form for rapid reference. Information is categorized under 26 headings of special interest to contractors. Case studies include information on geological formation, excavation practices, drilling equipment, bit performance, drill patterns, blasting data, and explosive ratios.—**American Cyanamid Co., 20 Rockefeller Plaza, New York 20, N.Y.**

It's the BALANCED Synclinal DESIGN

Sump Type (Cutaway) *Line Type (Cutaway)*

that makes MARVEL SYNCLINAL FILTERS Construction Industry's A-1 Choice

In the plants of America's industrial giants, as well as in smaller plants, Marvel Synclinal Filters are being installed on all types of hydraulic and other low pressure liquid circulating equipment. Marvels are chosen because of their excellent performance in protecting machines and increasing production by reducing down-time. They are proving again and again, their superiority in the one real test—ON THE JOB! The BALANCED Synclinal Design of Marvel Filters provides that all-important balance between maximum ACTIVE filtering area and sufficient storage space for filtered out particles—therefore, longer periods of productive operation are attained at the absolute minimum of maintenance. They meet J.I.C. Standards.

Not only plant operators, but also, OVER 750 ORIGINAL EQUIPMENT MANUFACTURERS have recognized the superiority of Marvel Synclinal Filters and now install them as standard equipment.

EASY MAINTENANCE

Both sump and line types may be disassembled, thoroughly cleaned and reassembled by any workman in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be obtained by multiple installation (as described in catalog). Choice of monel mesh sizes range from coarse 30 to fine 200.

WATER FILTERS

Both sump and line type filters have been adapted for use in all water filtering applications. No changes have been made in the basic, balanced synclinal design.

FILTERS FOR ALL TYPES OF FIRE-RESISTANT HYDRAULIC FLUIDS

Marvel's most recent development is a filter for the efficient filtration of all types of fire-resistant hydraulic fluids.

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As in the past, Marvel continues to offer IMMEDIATE DELIVERY.

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7227 N. Hamlin Ave., Chicago 45, Ill.
Phone: Juniper 8-6023

CME-4

Without obligation, please send me complete data on Marvel Synclinal Filters as follows:

- ☐ Catalog #107 on filters for Hydraulic Oils, Coolants & Lubricants
- ☐ Catalog #200 on filters for Fire-resistant Hydraulic Fluids (Aqueous Base)
- ☐ Catalog #400 on filters for Fire-resistant Hydraulic Fluids (Synthetic)
- ☐ Catalog #301 on filters for Water

Name .....

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City ..... State .....

A FAR MORE POWERFUL, FASTER AND EFFICIENT JACKSON VIBRATORY COMPACTOR

Combines all the versatility and wide adaptability features* that contributed to making the present JACKSON VIBRATORY COMPACTOR the predominant compacting medium on nearly all major paving projects! By all means get the complete facts concerning this new machine before making any commitments! Write today for literature which will soon be available!

There are more Jackson Vibratory Compactors in use than all other makes of pan-type compactors combined.

JACKSON VIBRATORS, INC.
LUDINGTON MICHIGAN

* ADAPTABILITY FEATURES OF PRESENT JACKSON COMPACTOR WHICH WILL ALSO CHARACTERIZE THE NEW MACHINE.

6 COMPACTING UNITS in workhead for maximum coverage.

2 COMPACTING UNITS in twin hook-up self-propelling. One man readily compacts up to 4,000 sq. ft. per hour in 10" layers.

1 COMPACTING UNIT fitted with operating handle and narrow base. Just right for the otherwise unreachable spots.

3 COMPACTING UNITS in tandem and staggered. One of many hook-ups to exactly suit conditions.

4 COMPACTING UNITS just fit this widening job. Change required only a few minutes.

HERE'S
GO-power

leveling fill

finishing between forms

cutting ditches

pushing scrapers

scarifying

backfilling

terracing

leveling land for subdivisions

working oil-mix

building road shoulders

bulldozing

spreading base

advertisement

that puts more money in YOUR POCKET

Adams 660 cuts sub-grade for R. B. Tyler Co., Jackson, Miss. . . . takes big bite at 4.7 mph, in median strip of 4-lane U.S. 61, between Natchez and Washington.

GO-power: to spread heavier lifts on the fill . . . cut deeper on ditch slopes . . . travel faster between jobs . . . back-up faster on shuttle passes . . . get *more* work done, every hour of the day. The built-in *GO-power* of Adams† heavy-duty graders speeds job completion . . . puts more money in your pocket.

J. D. Adams built the first leaning-wheel grader in 1885. He introduced the first Adams motor grader in 1928; and in 1954 the vast experience and facilities of the J. D. Adams Mfg. Co. were merged with the larger engineering and production capacities of LeTourneau-Westinghouse Company. Thus the Adams grader line, reflecting constant improvement over nearly three-quarters of a century, gives you today's most modern motor graders. These carefully designed, ruggedly built machines deliver the *GO-power* you need to handle the bigger, faster grading assignments demanded by you today.

For *every* kind of work, Adams heavy-duty graders give your operator not just one, but *several* full-power speeds. With easy-acting controls, he selects gear-ratios that get most work done, with least effort, and with greatest speed. With Adams' wider range of power-speed combinations, you can do up to 25% *more blade-work* than with competitive graders of comparable power and weight. †Trademark

turn page for more on **GO-power**

15 speeds* in Adams†

Adams heavy-duty graders have an 8-speed constant-mesh transmission (8 standard forward speeds and 4 reverse speeds). For wider work range, 3 creeper gears are available . . . making a total of 15 speeds . . . in Adams 150, 123, 104, and 80 hp graders.

You get up to 28% bonus blade-work

Adams graders do more work per day because they provide more working speeds at which maximum engine horsepower can be used. For example, on ditching and other heavy grading work, an Adams 550 takes a big cut, pushes a full blade of dirt, at 4.6 mph. Other 115-125 hp graders do not have this speed-power combination. When full power is required, they have to shift down to 3.6 to 4.0 mph. On jobs that require extra *GO-power*, the Adams produces up to 28% more work. This added production is FREE; Adams transmission costs no more.

27% extra production on shuttle grading

Most graders have only 2 reverse gears, with speeds to 7 mph. Adams has 4 reverse gears . . . 2 for blading and 2 for high-speed back-up. Many times your operator works a section too short to make turn-around worthwhile . . . so he backs-up. The Adams higher reverse speeds of 8 and 13 mph get the grader back to its starting point fast . . . convert otherwise wasted, reverse travel time to profitable production time.

Compare the Adams with some other grader having a top reverse speed of 6.3 mph. On a 400′ forward operation, with each grader blading at 4.5 mph, the work takes 61 seconds. At 6.3 mph, the competitive machine backs-up in 43 seconds, while the Adams returns in 21 seconds. The Adams *saves 22 seconds* on each 400′ cycle . . . has time to make 27% more cycles . . . does 27% more work.

Extra power . . . precise control

Adams optional creeper gears provide 3 operating speeds as low as 35′ per min. with throttle wide open . . . and 22′ per min. with engine speed cut-back. These slow speeds concentrate full engine power for scarifying old roadways and blading through sub-surface filled with stones and roots. Creepers eliminate the need for "slipping the clutch" at high RPM to get steady power at slow speed . . . reduce clutch wear and shock to machine. They also help you cut accurate finish grades, work and maneuver in close quarters.

Cuts non-productive travel time

Adams road speeds to 26 mph hold travel time to a minimum . . . give you at least 5 mph advantage over most competitive machines. Your Adams gets to the job sooner, and can work later. Just 10 minutes a day saved gives you *4 days* of bonus production in a year. And it's FREE with Adams' 8-speed transmission.

"660" smooths 90′ wide haul-road at 6.7 mph, for D & M Excavating Co., Morgan, N.J. . . . speeds haul and return of seven 25-yd. scrapers on million-yard dirtmoving job at Fresh Kills, Staten Island, N.Y.

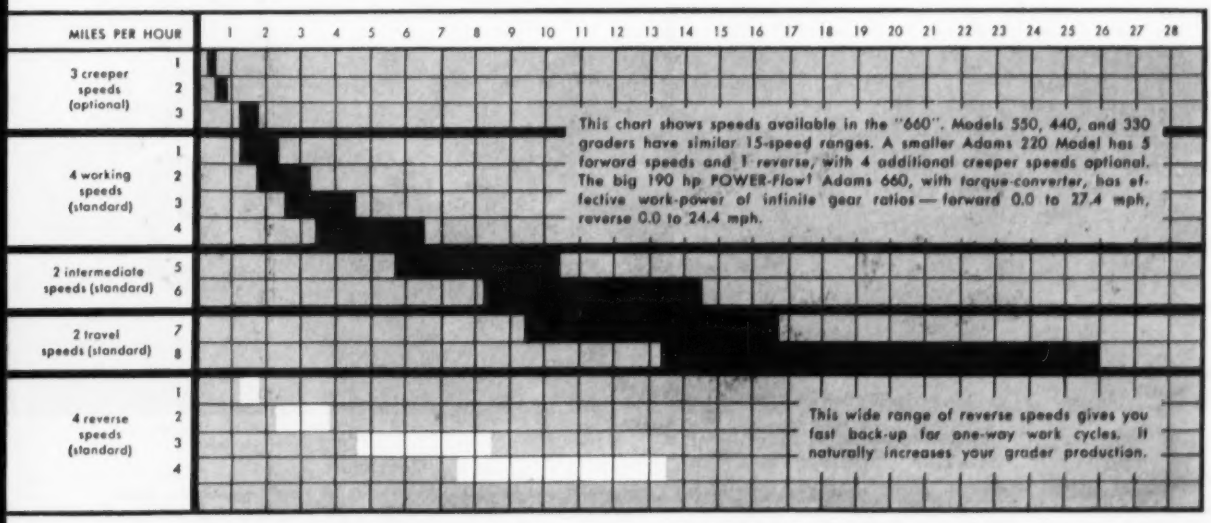
†Trademark

advertisement

graders give you more *GO-power*

With an Adams grader your operator can match speed to load, apply more power to hard cutting, travel fast job-to-job . . . get more work done in less time, at lowest cost! That's GO-power in action!

*Speed range of 150 hp Adams 660


MILES PER HOUR
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
3 creeper speeds (optional)
1
2
3
4 working speeds (standard)
1
2
3
4
2 intermediate speeds (standard)
5
6
2 travel speeds (standard)
7
8
4 reverse speeds (standard)
1
2
3
4
This chart shows speeds available in the "660". Models 550, 440, and 330 graders have similar 15-speed ranges. A smaller Adams 220 Model has 5 forward speeds and 1 reverse, with 4 additional creeper speeds optional. The big 190 hp POWER-Flow† Adams 660, with torque-converter, has effective work-power of infinite gear ratios — forward 0.0 to 27.4 mph, reverse 0.0 to 24.4 mph.
This wide range of reverse speeds gives you fast back-up for one-way work cycles. It naturally increases your grader production.

turn page for more on **GO-power**

GO-power

Extra *GO-power*

New Adams POWER-*Flow* 660 gives you maximum push-power at all speeds, 0.0 to 27.4 mph. This extra heavy-duty grader applies 190 hp thru 3-to-1 torque-converter to give you the effective work-power of an infinite number of power-speed ratios. POWER-*Flow* 660 works thru varying loads at constant speed . . . will not stall . . . starts extra-heavy loads without lugging. Torque-converter cushions engine and drive against shock . . . makes operation simpler. Your best bet on heavy construction work.

Low-cost *GO-power*

60 hp Adams Model 220 works at 10 full-power speeds . . . leads its class with 5 forward, 1 reverse, 4 optional low-low creepers. Sturdy 4-wheel tandem-drive provides plenty of push-power for average grading and ditching. Machine cuts costs by releasing heavier graders for the bigger jobs . . . handles haul-road maintenance, fine grading, and scattered assignments at minimum cost. The low price, and low maintenance of this machine, make it a sound investment as the "second" grader on any equipment spread.

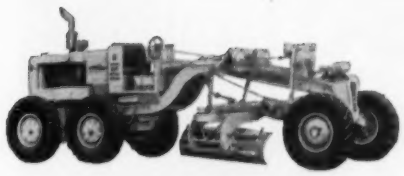
Scarifier

Available as optional equipment: strong, rigid V-type scarifier (straight-line type on Model 220) breaks up blacktop, hard-packed gravel roads, and other surfaces too tough for grader blade to cut. Blade can make full revolution without removing scarifier block.

Elegrader

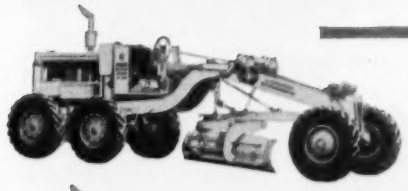
Excavates and loads 400 to 800 yds. of loose materials per hour into trucks; sidecasts 700 to 1500 yds. per hour to elevate roadbeds. High-speed conveyor heaps 10-yd. trucks in a minute. Available for Adams 660, 610, 550, 440, and Caterpillar No. 12 motor graders.

in all 6 Adams† graders

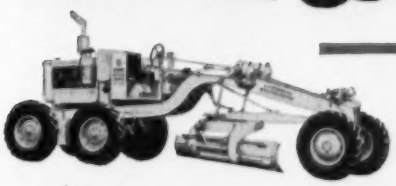


POWER-Flow†

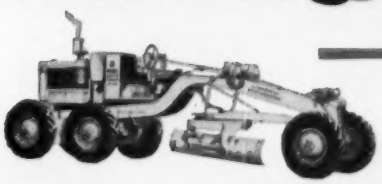
660* — 190 hp diesel engine and torque-converter. Biggest, fastest grader in the Adams line. 30,200 lbs.**



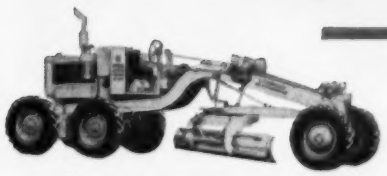
660* — An extra-heavy-duty machine with 150 hp diesel engine. 30,050 lbs.**



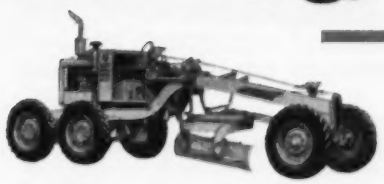
550* — Heavy-duty all-purpose tool, with 123 hp diesel engine. 26,320 lbs.**



440* — A sturdy, general-purpose grader in the 100 hp class. 24,080 lbs.**



330* — A high-speed worker in the 80 hp class. Diesel engine. 23,020 lbs.**



220 — 60 hp diesel, with hydraulic controls. Gives big-grader performance at low investment. 15,500 lbs.**

*Choice of Cummins or GM diesel engines. **Weights shown are usual working weights.

Size for size, all Adams graders give you extra "muscle" and more "hustle". Rugged tandem drive ... all-welded one-piece, high-arch wishbone frame ... husky front-end ... welded short-coupled blade mechanism ... *all* combine to give you a sturdy structure for using Adams great push-power at top speeds.

ASK FOR A DEMONSTRATION. See for yourself how an Adams takes bigger, deeper cuts ... pushes heavier loads ... moves dirt faster ... moves job-to-job quicker ... than competitive machines of similar size and power. Then consider how Adams *GO-power* will boost the output of your fleet ... speed project completion ... cut costs, and put money in your pocket. Your nearby LeTourneau-Westinghouse Distributor will be glad to arrange an Adams demonstration — *on your job.* Call him for all the facts and figures, or write us at the factory.

†Trademark AG-1426-G

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

BLAW-KNOX RECTANGULAR BOX SEWER FORMS

save time and cut costs on
Proctor Storm Drainage Project built by

SLOVAK BROTHERS

Corpus Christi, Texas

■ Here's another typical example of Blaw-Knox Steel Form Engineering which allowed this Corpus Christi general contractor to average daily pours of 80 feet on 10-ft. wide sewers, and meet all job specifications. The Proctor Storm Drainage Project required 1,710 feet of sewage conduit 10′ wide by 9′ high; 1,722 feet 10′ x 8′; and 2,843 feet 8′ x 7′, for a total length of 6,275 feet. One set of Blaw-Knox special rectangular box type adjustable forms easily handled the three sizes of conduit. The unique feature of the project was the system devised by Blaw-Knox engineers for supporting the conduit roof during pouring and curing. By using four sets of cross beam supports tied together with the outside forms, Slovak Brothers maintained a continuous pouring pace with one set of forms.

PLAN YOUR JOBS WITH BLAW-KNOX STEEL FORMS AND BLAW-KNOX CONSULTATION SERVICE

Cut *your* concreting costs by consulting Blaw-Knox in the preliminary planning stage of your next job. Blaw-Knox engineers have undoubtedly solved similar problems and saved money for other contractors, so by taking full advantage of the Blaw-Knox Steel Forms Consultation Service, you are assured of recommendations and proposals for the most efficient concreting methods and the most economical forming equipment. With over 40 years' experience as the original and most prominent manufacturer of Steel Forms, Blaw-Knox specializes in helping you plan for the simplified forming that builds your profits by keeping costs low. Write for details today.

BLAW-KNOX COMPANY

STEEL FORMS DEPARTMENT • BLAW-KNOX EQUIPMENT DIVISION
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50th Anniversary BLAW-KNOX 1906-1956

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APRIL IS

★ ★ ★

USO

★ ★ ★ ★

MONTH

Cut Clean, Punch True with These New, Extra Tough...

Snap-on CHISELS and PUNCHES

Snap-on set No. PC-170-K contains five starter punches and five drift punches 3/32 to 5/16 in.; five chisels 13/32 to 7/8 in.; and two sizes of center punches. Sizes are clearly marked on protective kit bag as illustrated.

This new *Snap-on* chisel and punch set contains the basic tools to handle a wide range of jobs. A mechanic can select the right chisel, starter punch or drift punch to get cleaner, more exact results, longer tool life.

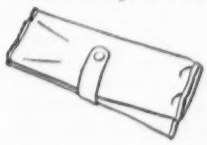
Here is why experienced mechanics prefer *Snap-on:*

Special Steels scientifically heat-treated for long life. High silica, manganese, molybdenum steel is heat-treated under controlled atmosphere for uniform hardness. Chisel and punch heads are then induction-drawn to reduce hardness to just the right degree. The result is a controlled-mushrooming, long-life striking surface.

70-Degree chisel edge cuts better, stays sharp longer. Exhaustive tests by *Snap-on* engineers show that by shaping cutting edge to a 70-degree angle, the chisel cuts better, stays sharp longer.

New Octo-Square shape for firm, comfortable grip. *Snap-on* chisels and punches are square shaped with beveled corners to give user a better, more comfortable surface for firm control, greater safety, and prevent tool from rolling out of reach.

New-Style hold-tight kit bag. New kit bag folds easily — has a transparent flap which keeps tools from dropping out.

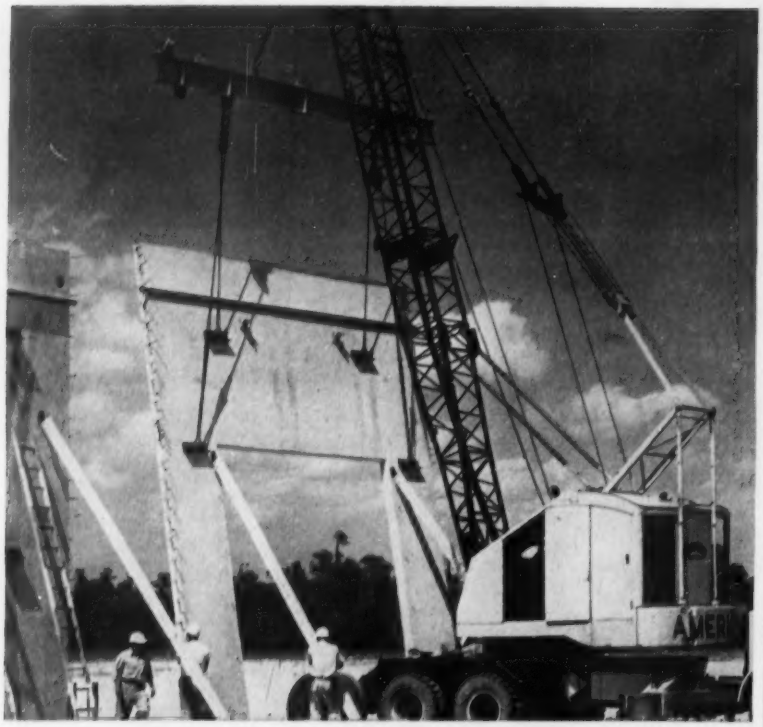


This chisel and punch set is one of many fine *Snap-on* tool sets. The *Snap-on* representative who calls on you can show you a complete range for production or maintenance work.

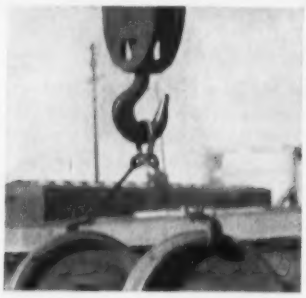
*Snap-on is the trademark of Snap-on Tools Corporation.

SNAP-ON TOOLS CORPORATION

8042-D 28th Avenue • Kenosha, Wisconsin



TILT-UP HANDLING SIMPLIFIED WITH CROSBY-LAUGHLIN SHACKLES



DROP FORGED RINGS OFFER GREATER SAFETY

Wire rope and chain sling safety is substantially increased by replacing welded links and rings with drop forged Crosby-Laughlin* Rings, Sling Links and End Links. Safety-conscious construction men demand these weldless, heat treated fittings because of their greater strength and reliability on every lifting job! Crosby-Laughlin Weldless Rings and Links are available with stock diameters up to 1⅜". Your distributor has detailed specifications on sizes and capacities.

*REGISTERED TRADEMARK

Handling tilt-up panels—almost any material—is made easier by using quickly adaptable shackles. You'll find them used everywhere, on every job!

Experienced construction men, miners and earth movers know that drop forged Crosby-Laughlin* Shackles give them reliable, long life performance with maximum safety for men and materials.

Vitally important to shackle safety is *perfect alignment* of pin holes that distribute load forces equally over the bow. Crosby-Laughlin Chain and Anchor Shackle pin holes are precision drilled in close tolerance jigs. Oversize pins, larger in diameter than the bow, resist shearing under shifting or shock loads.

For safety's sake, insist on genuine Crosby-Laughlin Shackles—manufactured under strict quality control—in a complete range of sizes from 3/16 to 3 inches.

A *complete* line of quality drop forged Crosby-Laughlin fittings is available from leading construction equipment distributors. They also have descriptive catalogs containing technical and engineering specifications on this line.

World's most complete line of drop forged fittings for wire rope and chain

CROSBY LAUGHLIN LEBUS

FORT WAYNE 1, INDIANA

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for them
around the world

April is USO Month

How torque converters *assure* higher dividends from your major equipment investments

Twin Disc Torque Converters, dependably and efficiently transmitting power to your heavy-duty machinery, *assure you a higher return* on your equipment investment, through *more work done in less* time . . . with a *minimum of maintenance and costly downtime.*

Here are six *profitable, proved* reasons why Twin Disc Torque Converters help you to earn *more* from your major equipment investments . . . such as the International TD-24 Tractor pictured above.

1. Three-stage design provides the highest engine output torque multiplication available—eliminating harmful, costly engine lugging and stalling.

2. Engines work up in the maximum efficiency range all the time, delivering *constant,* high-horsepower output . . . doing *more work* than units equipped with mechanical drive.

3. Power is matched to load demands automatically with gear shifting minimized or eliminated—where mechanical transmissions usually must *stay* in the starting gear ratio, even after starting load resistance is reduced . . . operator efficiency is boosted.

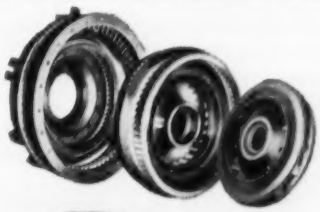
4. Heavy load pick-up is smooth, even, without clutch slippage . . . better flotation is obtained.

5. Overloads, shock loads and vibrations are cushioned out, through *fluid* connection . . . providing longer tractor life with less maintenance.

6. Infinite variety of ratios is available to work with, permitting smooth, accurate control of loads.

Be sure to specify a torque converter in *your* next International TD-24! And investigate the advantages of Twin Disc Torque Converters—both single-stage and three-stage—for most other heavy-duty applications from 30 to 1000 hp.

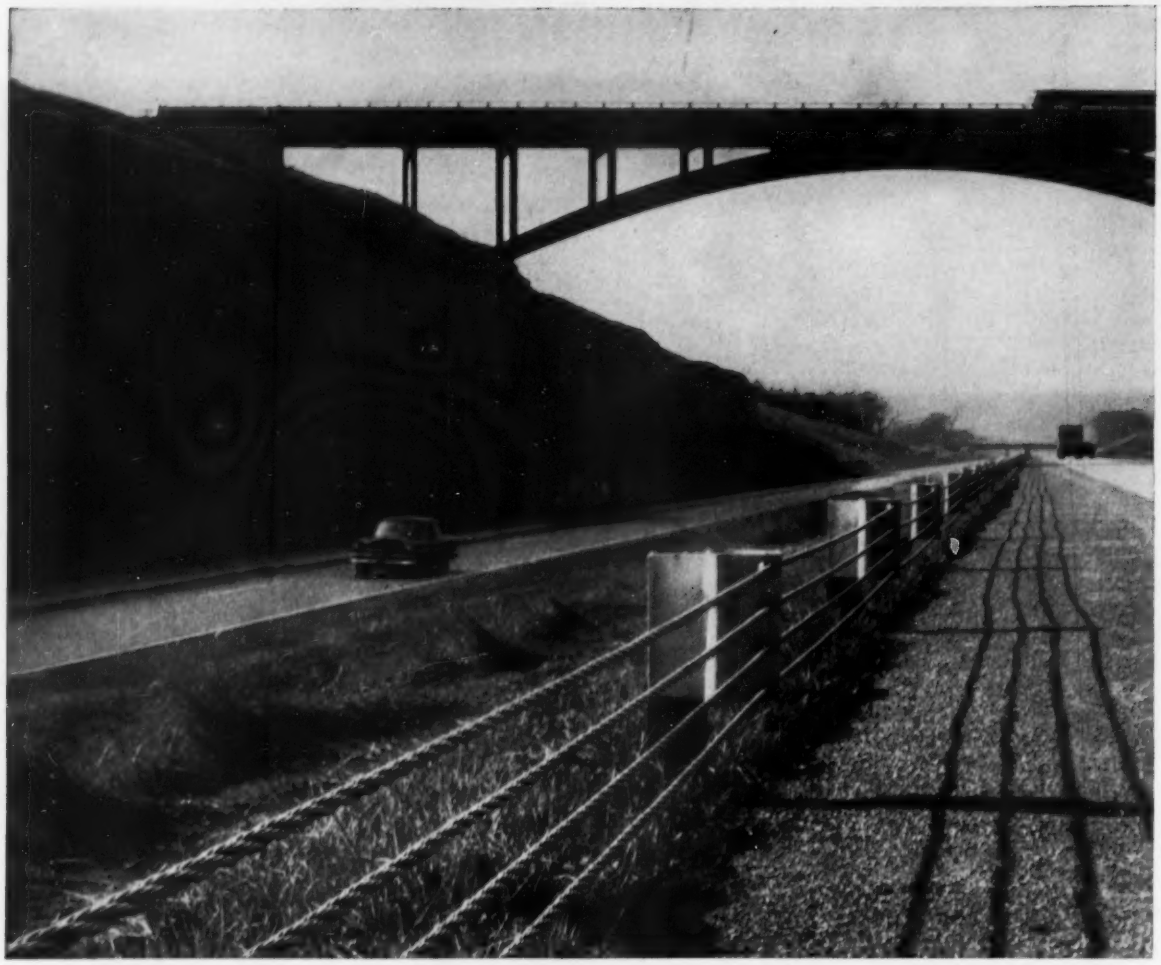
This International TD-24 is pushing a scraper and pulling a ripper simultaneously. International has standardized on Twin Disc components for the torque converter version of the TD-24.



TWIN DISC

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division), Rockford, Illinois



Bethlehem Cable Guard Rail Protects Motorists on Ohio Turnpike

Used as medial dividers and at bridge approaches, embankments and other danger spots along the new Ohio Turnpike, Bethlehem Cable Guard Rail forms a strong, effective barrier, with high resiliency and impact-absorbing qualities.

You can be sure of dependable protection for motorists when you install Bethlehem Cable Guard Rail. For this strong steel highway guard is designed for modern traffic, with its heavier volume and higher speeds.

Bethlehem Cable Guard Rail, with its special bumper-type bracket, is simple in design, easy to install, and low in cost. It requires little maintenance, can be used with either steel, wood or concrete posts, and is furnished to comply with any state regulations. It comes with two, three or four cables, and with 1-, 1¼- or 1½-in. anchor rods. Bethlehem furnishes cable guard rail, together with steel posts, brackets, cable ends, anchor rods, cable splicers and fittings, all of which assemble readily on the job.

Have you seen our big illustrated booklet, "Steel for Highways"? It describes fully the complete line of Bethlehem Steel products used in building modern highways. Contractors find it informative and helpful. You can obtain a copy by writing either to Bethlehem, Pa., or to the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

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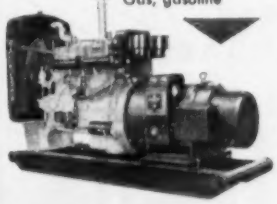
NOW— a complete line of

WAUKESHA

Industrial ENGINATORS®

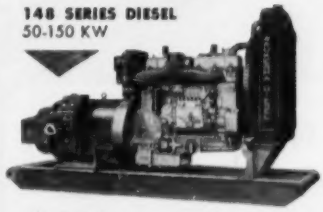
50-700 KW • NATURAL GAS • LPG • GASOLINE • DIESEL

145 SERIES—45-110 KW
Gas, gasoline

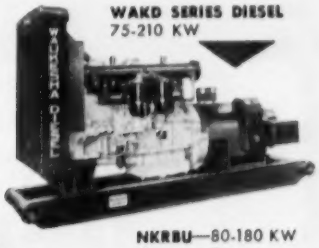


A superb line of Enginators— backed by over 50 years' experience in building heavy-duty engines and electrical equipment. For reliable performance on all fuels, these accurately balanced Waukesha engine-generator combination units supply smooth, steady power in continuous, intermittent and standby service.

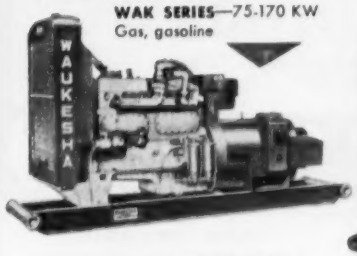
148 SERIES DIESEL
50-150 KW



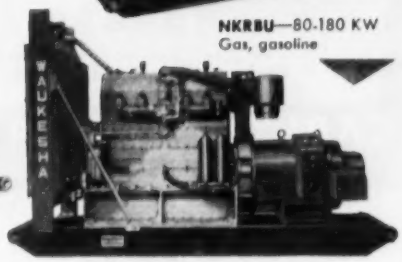
WAKD SERIES DIESEL
75-210 KW



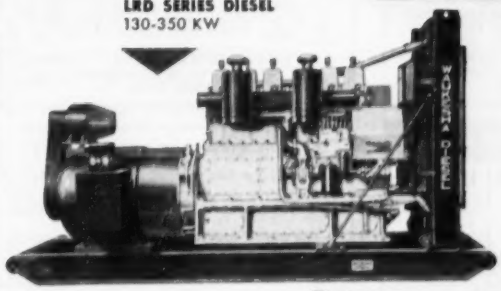
WAK SERIES—75-170 KW
Gas, gasoline



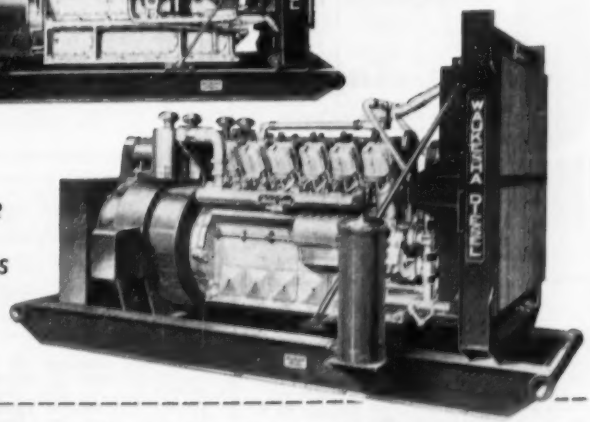
NKRBU—80-180 KW
Gas, gasoline



LRD SERIES DIESEL
130-350 KW



VLR SERIES—250-730 KW
LPG, natural gas, Diesel



WRITE FOR BULLETINS FOR THESE AND OTHER MODELS

333

WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN RAILWAY DIVISION

SEARCHLIGHT SECTION

Classified Advertising

EMPLOYMENT BUSINESS **"OPPORTUNITIES"** EQUIPMENT USED OR RESALE

UNDISPLAYED ——RATES—— DISPLAYED

$1.80 per line, minimum 2 lines. To figure advance payment count 5 average words as a line. Discount of 10% if full payment is made in advance for 6 consecutive insertions.

Positions Wanted undisplayed advertising rate is one-half of above rate payable in advance.

Box Numbers—count as one line.

The advertising rate is $18.90 per inch for Equipment & Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request.

Employment Opportunities—$26.00 per inch, subject to Agency commission.

An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

Send New Advertisements and Inquiries to Classified Adv. Div. CONSTRUCTION METHODS & EQUIPMENT, P. O. Box 12, N.Y. 36, N.Y. May Issue closes April 25th.

When You Need
LOW COST—DEPENDABLE
INDUSTRIAL RUBBER PRODUCTS

call CARLYLE

FOR ALL YOUR REQUIREMENTS OF

RUBBER HOSE

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PROMPT SHIPMENTS LOW COST QUALITY PRODUCTS

CARLYLE RUBBER CO., INC.
103-107 Warren St., New York 7, N. Y. Digby 9-3910

TANK TRAILERS
Used—For Sale or Lease, Chicago Area
25 tandem axle gasoline, fuel-oil and LPG trailers with capacities from 6500 gallon to 7900 gallon. Priced from $2000.00. Write, wire or phone.
BUTLER MANUFACTURING COMPANY
Suite 1110, 624 S. Michigan Ave., Chicago 5, Ill.
Phone WEbster 9-5035

TANK TRAILERS
Used—For Sale or Lease, Birmingham Area
8 single axle and tandem axle gasoline and fuel-oil trailers with capacities from 4000 gallon to 7400 gallon. Priced from $700.00. Write, wire or phone.
BUTLER MANUFACTURING COMPANY
931 Ave. "W", Ensley, Birmingham 8, Ala.
Phone 8-5181

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750/20	900/20	1100x24
Used Tire, Tube, Flap	Used Tire, Tube, Flap	12 Ply New
$17.50	$24.95	$95.00

Tractor • Truck
Earth Mover • Army Surplus
Passenger • Aircraft
Wholesale Prices
SEND FOR FREE CATALOG

Buddy's
152 No. Beacon St. Boston, Mass.
Post Office Box 846 Phoenix, Arizona

TANK TRAILERS
Used—For Sale or Lease, Minneapolis Area
20 tandem axle gasoline and fuel-oil trailers with capacities from 5400 gallon to 7900 gallon. Priced from $1000.00. Write, wire or phone.
BUTLER MANUFACTURING COMPANY
900 Sixth Ave., S.E. Minneapolis 14, Minn.
Phone FEderal 3-8111

TANK TRAILERS
Used—For Sale or Lease, New York Area
40 single axle and tandem axle gasoline, fuel oil, asphalt and LPG trailers with capacities from 4000 gallon up. Priced from $600.00. Write, wire or phone.
BUTLER MANUFACTURING COMPANY
Suite 602, 165 Park Ave., New York 17, N. Y.
Phone MUrray Hill 3-9473

REPLIES (Box No.): Address to office nearest you c/o this publication, Classified Adv. Div.
NEW YORK: P.O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

EMPLOYMENT

Aggressive salesman, 43 with 13 yrs. proven record obtaining top volume sales heavy Automotive Eqp. as Distr. Mgr., and 2 yrs. with Constr. Eqp. desires permanent connection in Mid-West, South, South-East. PW-4759, Construction Methods & Equipment.

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CLASSIFIED ADVERTISING
F. J. Eberle, Business Manager

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Construction Methods AND EQUIPMENT

330 West 42nd St., New York 36—LO 4-3000

E. E. WEYENETH, *Advertising Sales Manager*

Member of Associated Business Publications and Audit Bureau of Circulations

Sales Representatives

New York 36, 330 W. 42nd St.
R. H. LARSEN

Philadelphia 3, 17th and Sansom Sts.
L. S. KELLY, JR.

Atlanta 3, 1301 Rhodes-Haverty Bldg.
DOUGLAS C. BILLIAN

Cleveland 15, 1510 Hanna Bldg.
W. E. DONNELL

Chicago 11, 520 N. Michigan Ave.
H. J. MASUR, JR., D. J. McGRATH
J. L. RICE

Dallas 1, The Vaughn Bldg., 1712 Commerce St.
GORDON JONES, EDWARD E. SCHIRMER

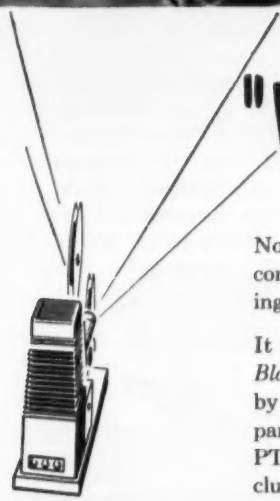
Los Angeles 17, 1125 West Sixth St.
H. L. KEELER

San Francisco 4, 68 Post St.
J. W. OTTERSON, R. C. ALCORN

London, E.C. 4, 95 Farringdon St.
McGraw-Hill Publishing Co., Ltd.
HERBERT LAGLER

Other Sales Offices:
Detroit 26: 856 Penobscot Bldg.
St. Louis 8: Continental Bldg.
Pittsburgh 22: 1111 Oliver Bldg.
Boston 16: 350 Park Square Bldg.

"We're blasting near you"



Now you can gain better public relations in communities where you are blasting by showing an interesting, informative film, in color!

It works, too. The film, entitled, "*We're Blasting Near You*" has already been shown by contractors and quarry operators in many parts of the country, to audiences including PTA groups, civic organizations and service clubs.

The movie tells why blasting is necessary, and explains the steps you are taking to "be a good neighbor." It shows how millisecond delay techniques eliminate the old-fashioned, jarring explosions of the past, and how modern blasting methods keep noise, vibration and flying rock to a minimum.

This unique film is accompanied by a kit of suggested news releases, sample speeches, safety posters and other helpful material—everything you need to conduct a successful meeting in your community. Plan now to get the important public relations benefits from showing "*We're Blasting Near You.*" Write, telling us the approximate dates you'd like to schedule it.

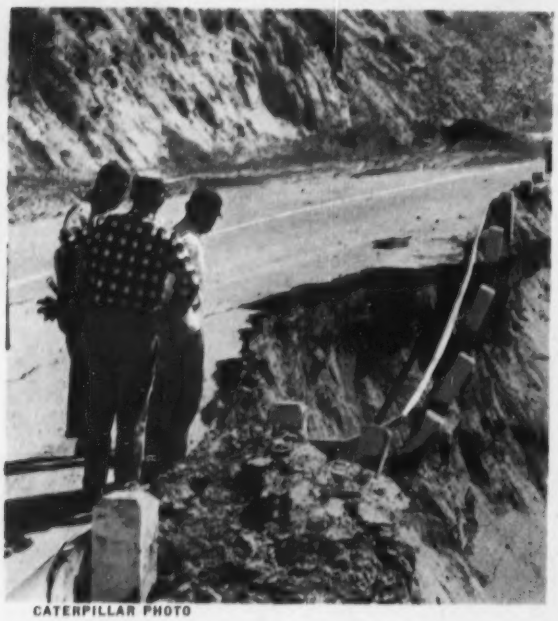
Technical Customer Service Section

ATLAS POWDER COMPANY

WILMINGTON 99, DELAWARE

offices in principal cities

Methods Memo . . .



CATERPILLAR PHOTO

Badly Shaken Road

California Highway 1 just south of San Francisco was a major casualty of the March 22 earthquake, the worst since the 1906 disaster. Some sections of the highway broke off and tumbled to the beach below; other sections were blocked completely by sand slides.

But in general the damage to the heavily populated area was minor—mostly just broken windows and cracked plaster. The worst quake in half a century caused few injuries and no loss of life.

A Profitable Exchange

The Los Angeles Chapter of the Engineering and Grading Contractors Association offers an unusual service to its members—a "dirt exchange."

Each week the chapter's news letter, "The Trading Post," carries a number of notices under the two headings, "Dirt Available" and "Dirt Needed." Each notice tells the amount and type of material, where available or needed, and who to phone to make arrangements.

Members say the service is a real time and money saver. Weight restrictions on streets and haul distances in the sprawling Los Angeles area add up to high excavating costs. Through the dirt exchange a contractor may find the fill material or spoil area nearest to his job.

The service has been in operation about four years. Nobody knows how much dirt actually has been exchanged because contractors make direct contact with each other. But members of the chapter say it's a cinch the total must amount to many million of yards.

For Safety Men

Contractors looking for safety engineers and safety engineers looking for jobs can get together at a clearing house just established by the National Safety Council's Construction Section.

A special subcommittee has been formed to keep a file of contractors who need safety engineers for new jobs and safety engineers who are, or shortly will be, available for another job.

A contractor or safety engineer can make use of the clearing house by writing either the subcommittee chairman, Frederick H. Deeg, 20 North Wacker Drive, Chicago 6, or the staff representative of the NSC Construction Section, Clement J. Luepke, 425 North Michigan Ave., Chicago 11.

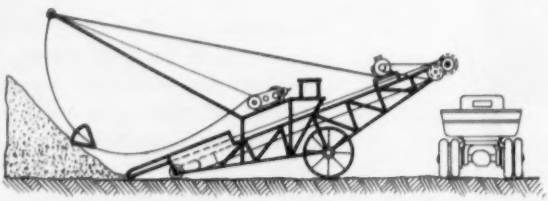
More Roadbuilders

Federal Highway Administrator Bertram D. Tallamy looks for a number of new roadbuilding firms to be formed as the big national highway building program picks up steam.

In his talk at the AGC annual convention last month, he said:

"While we have 6,000 contracting organizations now available for this work, I believe there should be more. It is our intention in this program to have small contracts as well as big ones. There will be plenty of big contracts, and there will be a large number of small contracts as well.

"All of the varying size organizations in the 6,000 will have plenty of work ahead of them, and there will be ample opportunity for new contracting organizations to enter the field. Now that may not be pleasing to you, I don't know. It will mean more competition, and more competition, I think, is good for everybody. It sharpens our wits, it increases our efficiency and produces better workmanship because we are in that competition.



Behind the Iron Curtain

Heres an example of Russian ingenuity with construction equipment. It's a job-built rig developed by N. A. Tshinsh, a mechanic of the Kiev Harbor Administration, to speed loading of trucks.

A steel pipe frame welded to the middle of the frame of the conveyor belt provides a platform for a motor that powers a two-drum winch. Winch cables loop around a roller mounted on the end of a 25-ft steel pipe extension arm to control a dragline bucket that dumps on the conveyor belt.

No. 4 of a series

guide to BETTER CONCRETING*

Seal in the moisture.

curing makes better concrete

Concrete must be cured to obtain its full value as a building material. Correctly cured concrete has higher strength, less shrinkage, less cracking and a better surface. Curing should begin as soon as possible after concrete hardens.

Membrane curing is the most practical method, as it can be put on the moist surface immediately after the final finishing operation, or when the forms are stripped. For helpful information on curing, ask for a copy of our guide "Curing Makes Better Concrete."

*From booklet by this name. Covers points that can make the difference between a good job and a poor one. Copy on request.

a quiz on CONCRETE

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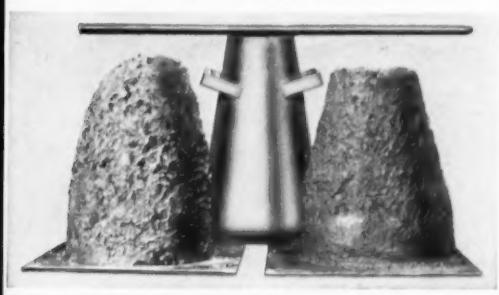
With Lower Water Content



PLAIN MIX		POZZOLITH MIX
6.75 gallons	W/C	5.63 gallons
2 inches	SLUMP	3 inches

Question: How can I get easy, fast finishing . . . at lowest end-cost?

Answer: With Pozzolith, which *increases* workability, even though not as much water is used — see illustration at left.

Increased workability makes *easier* placing . . . lower water content makes *faster* finishing. Lower water content also reduces cracking.

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